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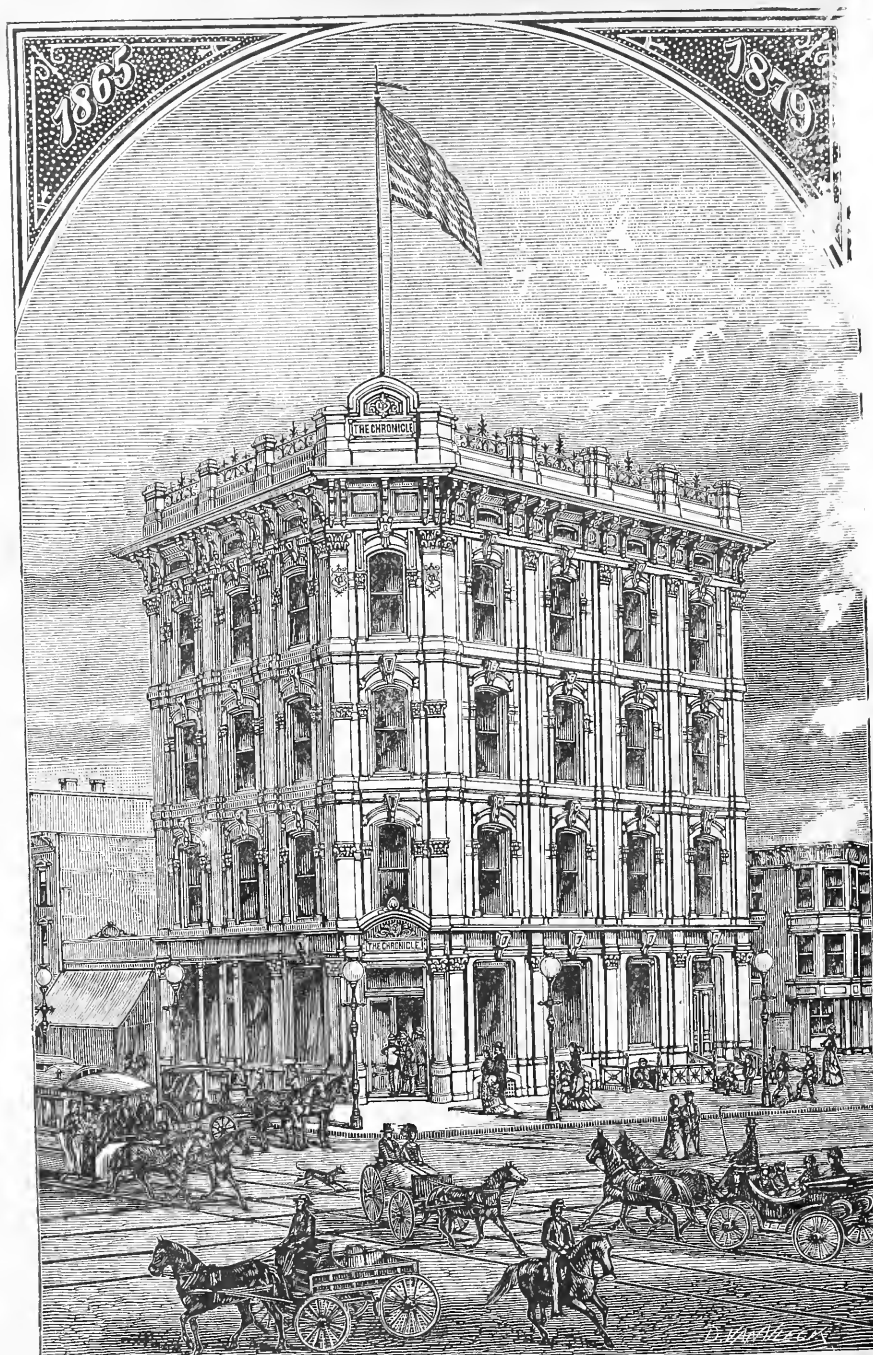
MEXICO.

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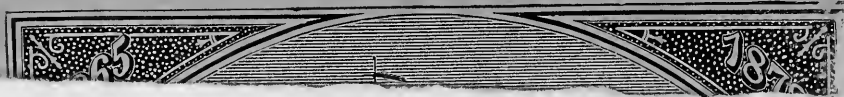
This Map is published with the permission of the San Francisco edition a Map of the Border States of Mexico from the latest official of the Coast outline of Mexico and Central America. We shall the same having appeared in an issue of Jan. 27, 1881. We insert

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This Map is published with the permission of the San Francisco "Journal of Commerce," the same having appeared in an issue of Jan. 27, 1891. We insert it to give a general view of the Coast outline of Mexico and Central America. We shall also publish in a future issue a Map of the Border States of Mexico from the latest official maps.

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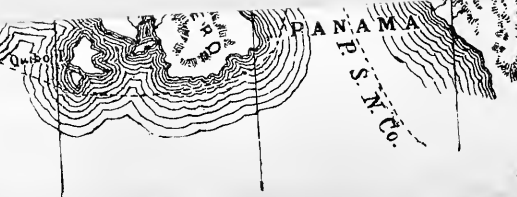
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"Journal of Commerce,"
THt to give a general view
also publish in a future
surveys.



BORDER STATES OF MEXICO:

SONORA, SINALOA, CHIHUAHUA AND DURANGO.

With a General Sketch of the Republic of Mexico, and Lower California,
Coahuila, New Leon and Tamaulipas.

A COMPLETE DESCRIPTION OF THE BEST REGIONS

FOR THE

Settler, Miner and the Advance Guard
of American Civilization.

THE MINING DISTRICTS AND MINES, THE AGRICULTURAL AND GRAZING
REGIONS, CITIES AND TOWNS, LOCATION AND DISTANCES AND PRIN-
CIPAL BUSINESS MEN, FACTORIES, ETC., EXPORTS, IMPORTS AND
PRODUCTIONS; TO WHICH ARE ADDED, RESOURCES OF
MEXICO, DUTIES, THE TRADE WITH MEXICO, HOW
TO ACQUIRE PROPERTY IN MEXICO, RAIL-
ROADS AND TRAVELING IN THE
REPUBLIC,

Collected from all the Works extant on Mexico, and Reports of Travelers, Official Records,
and Reports of Mining Experts and Old Residents, with Information
up to date; the whole making

A COMPLETE GUIDE

FOR

TRAVELERS AND EMIGRANTS.

BY

LEONIDAS HAMILTON.

SAN FRANCISCO:

BACON & COMPANY, BOOK AND JOB PRINTERS,
Corner Clay and Sansome Streets.

1881.

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INTRODUCTION.

Believing that a more complete description of the northern part of our sister Republic will conduce to the advancement of the mutual interests of the United States and Mexico, the author submits the result of careful investigation of the four northern states of Mexico to the public. We respectfully acknowledge our indebtedness to Ex-Governor Monteverde, of Sonora, and Benjamin R. Rountree, John A. Robinson, Don Celedonio Ortiz, L. Gilson, and I. Thannhauser, of this city, and E. C. Hoffman, of San Jose, and many others, for much of the information contained in the following pages. We have also availed ourselves of the valuable and almost inaccessible work of Mr. Ward on "Mexico in 1827," from which we have taken everything of interest applicable to the subject-matter; and the valuable work of Mr. Mowry on Sonora and Arizona, and the impartial Spanish work of Francisco Velasco on Sonora, and translated into English by Mr. Wm. F. Nye, in this city, in 1861, and the work entitled "Travels on the Western Slope of the Mexican Cordillera," by Cincinnatus, and Mr. Ruxton's work on "Adventures in Mexico," and the late work of Antonio Garcia Cubas on "The Republic of Mexico in 1876," translated by Mr. Geo. E. Henderson, in Mexico, and official records and papers, and numerous other works, including pamphlets both in the English and Spanish languages. We have also been rendered valuable assistance by the Mexican Consul and the Honorable Ex-Judge of the Supreme Tribunal of Sinaloa and Lower California, Carlos F. Galan, now practicing law in this city, and many other American and Spanish gentlemen, who have kindly rendered us every assistance in their power.

We have endeavored to give only the facts as we find them, without unnecessary embellishments or fanciful description; the object being to make the contents of value for reference as well as interesting to persons desiring to travel through or emigrate to those portions of Mexico to which we have given our attention, for the purpose of engaging in mining, agriculture, or stock-raising; or for persons desiring to make profitable investments in those four states. We have availed ourselves of every data that we could obtain, in order to give a complete description, together with routes of travel and distances, cities and towns, the principal business men, the resources of Mexico, etc. We have also included, in a condensed form, a general view of the Republic of Mexico, and the territory of Lower California, and the border states of Coahuila, New Leon, and Tamaulipas. In addition, we have referred to the most important land laws restricting American citizens from acquiring real estate in any of the border states.

With the good opportunities offered in those states, we have also attempted to point out the unfavorable features, in order to give an impartial work to the public. We have necessarily been compelled to condense much of our information, in order to bring the work within the reach of all, and at the same time give the most important data to the public. In some instances, we have found it exceedingly difficult to give as complete information as we desired, and we have, therefore, been careful to state positively only those facts that could be verified.

Respectfully submitted.

THE AUTHOR.



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GENERAL DESCRIPTION OF THE REPUBLIC of MEXICO.

Physical Features.

In a work entitled "Adventures in Mexico," the author, Mr. Ruxton, says of the physical features of Mexico, that "a glance at the physical geography of Mexico will show that the extensive and fertile lands of the central regions are isolated, and, as it were, cut off from communication with the coast by their position on the ridge of the Cordilleras, and the insurmountable obstacles to a practicable traffic presented by the escarpments of the terraces, the steps, as it were, from the elevated table lands to the maritime districts and the tropical regions of the interior. The country is also destitute of navigable rivers. (He seems to have lived before the age of railways). Its eastern coast is swept at certain seasons by fearful tempests, and presents not one sheltering harbor or secure roadstead. The tropical region is subject to fatal malaria, and is almost excluded from a settlement of white population; and, consequently, its natural riches are almost entirely neglected. The vast table land which stretches along the ridge of the Cordilleras of Anahuac, although possessing tracts of great fertility, is not in itself the rich and productive region it is generally represented to be. The want of fuel and water must always prevent its being otherwise than thinly populated."

Political Divisions and Population.

The present population of the republic, as near as can be estimated, from the work of Antonio Garcia Cubas, of the City of Mexico, is somewhere in the neighborhood of

9,525,000, in round numbers, taking into account an increase since 1876: divided among the different states, as follows :

Sonora	125,000	Oaxaca	680,000
Coahuila	115,000	Chiapas	200,000
Chihuahua	190,000	Durango	185,000
New Leon	200,000	Zacatecas	420,000
Tamaulipas	180,000	Aguas Calientes...	100,000
Vera Cruz	550,000	San Luis Potosi...	555,000
Tobasco	100,000	Guanajuato	900,000
Campeachy	95,000	Queretaro	170,000
Yucatan	350,000	Hidalgo	430,000
Sinaloa	200,000	Mexico	750,000
Jalisco	980,000	Morelos	150,000
Colima	75,000	Puebla	750,000
Michoacan	620,000	Tlaxcala	130,000
Guerrero	350,000		
Total			9,500,000

With the territory of Lower California, which Antonio Garcia Cubas, in his geography of Mexico, places at 23,195, in 1874, the population of the whole republic may be estimated at about 9,525,000, allowing an increase in Lower California, up to 1880, or about six years, of about 2,000 more.

National and State Governments.

The government of the Republic of Mexico is divided into three branches, viz., Executive, Legislative, and Judicial; President, (and Cabinet, Congress, and Supreme and District Courts.)

The Congress of the confederation is divided into two branches, viz.: a Chamber of Deputies and that of Senators. The deputies are chosen by the majority of qualified citizens to vote in each state and territory—one for every 40,000 inhabitants, or for a fraction not less than 20,000. It is also requisite to have arrived at the age of 25 years, and to have enjoyed the ample exercise of citizenship, in order to hold this office. The Chamber of Deputies is wholly renewed every two years, and no deputy shall hold an office of trust or emolument in state or nation, while serving in the National Congress, according to the constitutional compact or Constitution. Two Senators are elected in each state by the majority; two in the federal district, which includes the City of Mexico, and an equal number in each of the

states are elected in turn, by the Senate, the Supreme Court, and the Chamber of Deputies of the states respectively. The Senate of the republic decides the election of such as do not obtain the votes of all three, but such as have been voted for by some one of them. The age of eligibility is 30 years, and the aspirant must be in the full exercise of the rights of citizenship. Also, it is necessary to have held some office of high trust equal to that of Superior Chief of the Treasury. One-third of this chamber is renewed every two years. In each chamber a quorum is found by one more than half its members. Senators, during the term of their office, shall hold no other positions of trust in the republic, at the same time. To be eligible to the office of President, it is necessary to be a native citizen, 35 years of age, and a resident.

The executive power of the republic is vested in a President and four secretaries chosen by himself: Secretaries of the Interior and Foreign Relations, Justice and Ecclesiastical Affairs, Treasury, War and Marine Concernments. These Secretaries must be native citizens. The President is chosen for four years.

The judicial power of the republic resides in a Supreme Court, three Circuit Courts, and those of the districts.

The Supreme Court is divided into three halls, comprising in all eleven ministers of justice and one fiscal. Besides those for civil and criminal trials of the first instance, there are Judges and Constitutional Alcaldes. To be eligible to the office of Supreme Judge it is necessary to be learned in the law, a native citizen, and approved by the national legislature. The state government is composed of a Governor, Legislature, and Judiciary. The state judiciary are appointed by their respective governors and confirmed by their legislatures. The interior government of the territories resides in a Political Chief dependent on the general government of the nation, in a deputation elected by the citizens thereof, and also in the inferior courts necessary for the administration of justice. And for this purpose they are divided into districts, counties, "departments" or partidos, which are under the charge of prefects or sub-prefects, appointed by the governors. This constitutes the state judiciary. The Legislative Branch consists of a Chamber of Deputies and Senators, elected by the people. The Governor is elected by the people, but he can be deposed by the general government, with secretaries of the same character as the general government. Every Mexican by birth or naturalization and

21 years of age is a citizen of the Mexican Republic, unless disqualified for the commission of some crime. Personal securities are granted by the Constitution the same as in the United States.

The national religion is Roman Catholic under the Constitution. The clergy have special legislation, the army its code called the "*ordenanza*." The number of officers of the general government amounts to 2,990; pensioners, 940; the number of ecclesiastics, 3,290. The annual revenue of the clergy from various taxation amounts to over \$10,000,000. The convents of monks, 140; convents of nuns, 60; colleges of the Propaganda Fide, 8; while the monasteries contain 1,140 monks, 1,540 professed nuns, 740 girls, and 880 female servants. Mexico, the capital of the republic, has about 325,000 population.

The republic was declared independent February 24th, 1821, established as an empire under Iturbide in 1822, and proclaimed a republic December 2nd, 1822, by Santa Ana. Iturbide abdicated March 20th, 1823. The republic contains 27 states, 1 territory, and 1 federal district. The present Constitution was adopted February 5th, 1857.

Education.

At one time during the early period of the republic about one-half of the population of Mexico could neither read nor write. The provisions for education are now somewhat extensive. In the city of Guadalajara, in the state of Jalisco, there are two scientific and literary academies, that of the Sociedad Filvocatrica and that of Falangede Estudio. The expenses of public instruction are commonly borne by the state governments and municipalities besides in many of the considerable towns. In the City of Mexico there are 129 public establishments of learning, with about 8,000 pupils of both sexes. The establishments dedicated to secondary education in the republic consist of conciliary seminaries, supported and directed by the clergy. The colleges and institutes of learning in the several states are supported by donation funds settled upon them and by direct appropriations, and the national colleges also in the same manner. Of that class there are 10 in the capitals of the bishoprics, and of the latter class there are six in the city of Mexico—namely, San Ildefonso, San Gregorio, San Juan de Letran, the School of Medicine, the College of Mining, and the Military College; with three public libraries—namely, that of the

Cathedral with 13,000 volumes and manuscripts, that of the University with about 3,000 volumes, that of San Gregorio with over 11,000, and that of San Juan de Letran with about 11,000 volumes.

The principle of obligatory education is now in force in the greater part of the states of the republic, penalties having been decreed for those who contravene the law, and rewards for those who voluntarily observe the same. Primary instruction in the schools of the republic consists of the following branches: Reading, writing, Spanish grammar, arithmetic, tables of weights and measures, morality, and good manners; and moreover, in the girls' schools, needlework and other useful labors. In some of the states the study of geography, national history, and drawing are also obligatory; whilst, in the schools that are not supported by the government, a knowledge of algebra and geometry is taught, with the elements of general and natural history, ornamental and lineal drawing, and the French language. The number of primary schools in the whole of the republic reaches 8,103. Of the number referred to, according to the work of Señor Diaz Covarrubias, 603 are supported by the state governments, 5,240 by the municipal authorities, 378 by private corporations or individuals, 117 by the Catholic clergy, besides 1,581 private establishments that are not gratuitous, and 184 not classified. These schools are attended by scholars of both sexes. Secondary instruction, as well as professional education, are under the charge of the state, with subjection to the programmes established by the law, which prescribes as a mandate the liberty of education and professions.

In the republic there are 105 establishments of secondary and professional instruction. These embrace preparatory schools, civil colleges of jurisprudence, schools of medicine and pharmacy, (no one can practice medicine or keep a drug-store without a diploma from the government) schools for engineers, naval schools, commercial schools, academies of arts and sciences, agricultural schools, academies of fine arts, conservatories of music and oratory, military colleges, conciliatory seminaries supported by the Catholic clergy, blind school, deaf and dumb school, and secondary schools for girls. In these latter, mathematics, cosmography, geography, domestic medicine, history and chronology, book-keeping, domestic economy, and duties of women in society, natural, figured, and ornamented drawing, manual labors, horticulture and gardening, music, the French and Italian languages—cer-

tainly, a young lady who graduates in these schools may be said to be accomplished, and our female seminaries might find some suggestions in a finished education. The whole number of educational establishments is 8,208, with 364,809 pupils. Besides these are eight model schools; 285,509 males and 79,300 females receive instruction, and this does not include the education under private tutors. There are 20 public libraries in the state, containing, in the whole, 236,000 volumes; and private libraries, containing from 1,000 to 8,000 works, are innumerable; and there are some with as many as 20,000, and collections of manuscripts and books upon history and travels, literature, law, biography, eloquence, encyclopedias, classic authors, mathematics, physical sciences, and antiquities, relating to America, Asia, Egypt and Nubia.

The most remarkable museums of the Republic are those of antiquities in Mexico, Campeche, Puebla and Merida; those of paintings in Mexico, Oaxaca and Puebla; those of natural history in Guadalajara and Mexico. The National Museum of Mexico, to which is annexed that of Natural History, contains a rich collection of Mexican antiquities, hieroglyphics, manuscripts, arms, utensils, idols, jewels, and every species of ornaments.

The Museum of Natural History at the Mining College, now the School of Engineers, is composed of two cabinets. In the first, there is a well classified collection of geological specimens, and another of zoology, which contains a large assortment.

In the second, are found two collections of minerals from Europe and Mexico, arranged according to the chemical mineralogical system of Bergelius.

The Academy of San Carlos, named in honor of Carlos the Third, of Spain, is one of the most notable institutions of the City of Mexico. It contains several galleries, where numerous original and valuable old Spanish and Italian paintings are to be seen. Among others, are works of Leonardo de Vinci, Murillo, Vernet, Coglietti, Canova, Van Dyck, Cortona, Perugino, Ingres, Decaen, Reni Marko, and other works of Podesti and Silvagni, and several of the Flemish and Dutch schools. In the other saloons are to be seen the paintings of some of the most proficient students of the Academy; also, many remarkable paintings of ancient Mexican artists, as Cobreza, Aguilero, the Juarez family, Ybarra, Arteaga, Vallejo, Echave, and others.

In the republic there exist 73 institutions dedicated to

the cultivation of arts and sciences, of which 29 are scientific, 21 literary, 20 artistical, and three of a mixed character.

Resources of Mexico.

There are now being established, in the greater part of the states of Mexico, cotton, woolen, silk, earthenware, glass, and paper factories, which will add to her present prosperity. If all this great territory were populated, even in proportion to Guanajato and its territory, the census of the republic would reach 58,000,000 to 60,000,000, instead of only 9,000,000 to 10,000,000. This scarcity of population is the one great cause of the undevelopment of the vast agricultural resources of Mexico; and when they are fully developed, they will constitute an element of enormous wealth.

Within the territory of the republic, there are more than 5700 haciendas, (landed estates) and 13,800 farms, (ranchos) and not a few other locations, of immense extent. The value assigned to landed property, based simply on its valuation for taxes, is \$161,397,311. The real value may be said to be double that amount, or about \$323,000,000. The maize which is grown all over the territory, the wheat in the upper table-lands, the rice in the warm and damp sections, the coffee, vanilla, tobacco, sugar, and cotton in the hot countries, and many other articles, among which may be mentioned the "agave Mexicano," with its abundant returns, constitute the principal branches of national agriculture, and the annual products may be safely estimated at \$100,000,000. If colonies were settled in this vast territory, employing their activity and intelligence in making such rich and extensive lands productive, under the influence of the varieties of climate, the benefits derived to Mexico are almost incalculable.

The rich and varied mineral productions of the republic have placed its mines in the niche of fame; and were it not for the scarcity of population before mentioned, they would produce a revenue that has never been dreamed of, in the imaginations of their Spanish conquerors.

The mines of Guanajato, which have been the most worked, and yielded enormously, still present immense wealth, with no signs of their being exhausted. The soil of Guerrero has been pronounced, by a Spanish mineralogist as one extensive crust of silver and gold. This seems like exaggeration, yet it has in a measure proved to be true in

the immense deposits there found. In Sinaloa the waters have submerged rich treasures, among others the famous mine of La Estacata.

The states of Zacatecas, Sonora, Chihuahua, Durango, San Luis Potosi, Hidalgo, Mexico, and Michoacan contain within their mountain ranges veins of gold and silver in inexhaustible riches. Although the best portion of the mineral district lies in the northern states of the republic, yet throughout its whole territory metaliferous deposits are found. Silver and gold are mostly worked, while the other metals and mineral substances, such as copper, iron, zinc, lead, magistral, antimony, arsenic, cobalt, amianthus, and copperas are almost neglected. The mountain of Popocatepetl is said to be one vast pile of sulphur. Salt mines are found at Peñon Blanco, in San Luis Potosi, Tamaulipas, south of the Isthmus of Tehuantepec, and in the islands of the Gulf of California. The Lake of Texcoco and its adjacent lands possess an extensive supply of carbonate of soda. In every state there exist quarries of white and colored marble. The alabaster of Tecali, in the state of Puebla, has attracted great attention, and the extensive coal-fields, platina, and quicksilver mines all add to the wealth of this great territory. Precious stones are not unknown; the opal with as varied and beautiful hues as those of Hungary, the turquoise, garnet, topaz, agate, and amethyst besides, are found extensively in many places. Building stone of a great variety is plentiful, from which magnificent structures may be built. Aside from the amount of ores that are worked outside of the republic on account of the law permitting free exportation of mineral ores, the annual coinage in gold, silver, and copper is on an average of \$20,500,000, and the whole amount of coinage since the establishment of the mints up to 1875 being \$3,001,237,281.62. In the colonial period (1537 to 1821): Silver, \$2,082,260,657.44; gold, \$68,778,411; copper, \$542,893.37—total, \$2,151,581,961.81. Since the independence, or establishment of the republic (1822 to 1875): Silver, \$797,055,080.71; gold, \$47,327,383.11; copper, \$5,272,855.93—total, \$849,655,319.84. Total silver, \$2,879,315,738.21; gold, \$116,105,794.11; copper, \$5,815,740.30. Grand total, \$3,001,237,281.62.

Within the last five years, since the investment of additional foreign capital, the amount additional, on the average of twenty and one-half millions a year as the lowest estimate, would reach \$102,500,000 more, which would make the sum total in 1880, \$3,103,737,281.62 as the amount coined by the republic of Mexico.

To show the increase of production, from the records of the mints, we herewith give the amount coined up to 1865, to compare with the amount coined in 1875, from official records, the first being taken from "El Minero Mexicano" of December 2nd, 1880, and the second or latter from Cubas' valuable work, which he claims to have obtained from the records at the mints.

**Amount of Money Coined in the Republic of Mexico
from 1772 to 1865.**

In the Mints of	Silver.	Gold.	Total.
Mexico	\$2,163,836,764	\$77,753,472	\$2,241,590,237
Catorce	1,321,545	.....	1,321,545
Chihuahua	15,626,400	1,286,095	16,912,495
Culiacan	12,795,505	4,735,285	17,530,791
Durango	35,294,581	3,139,889	38,434,470
Guadalajara	28,288,333	754,487	29,042,820
Guanajuato	164,591,216	15,094,529	179,685,745
San Luis Potosi	48,745,584	.....	48,745,584
Oaxaca	910,927	236,120	1,147
Zacatecas	204,234,941	550,008	204,784,949
Guadalupe y Calvo	2,063,958	2,311,104	4,375,062
Sombrerete	1,551,249	.....	1,551,249
Tlalpam	959,116	203,534	1,162,650
1865.—Total	\$2,680,220,119	\$106,064,534	\$2,786,284,654
1875—Total amount coined from 1772	\$3,001,237,281 62		
1865— " " deducted	2,786,284,654 00		
Increase in 10 years	\$214,952,627 62		
(or about \$21,495,262.76 cents annually.)			

The average annual production of the mines of Sonora, from 1835 to 1842, was given by Francisco Velasco at a rough estimate of \$1,500,000 annually, or \$10,500,000 during the period of seven years. In 1828, Don Juan M. Riesago estimated the annual production at \$2,000,000.

The laws originally demanded that all bullion should be brought to Mexico to be coined, and the cost of carrying was so great that the rich mines in these border States became almost neglected by capitalists, and the poorer ones nearest to Mexico City were mostly worked. This resulted in the smuggling of bullion out of the mines in the northern states of the republic, and no record could be kept at the mints, of those mines—in fact, there are no reliable records that give any account of the exports of bullion either from Mazatlan or Guaymas, although some records exist covering

the last few years; while it is well known that the mines in those States have been extensively worked in certain localities for over a century.

Lower California.

This embraces a territory or peninsula, washed on its western shores by the Pacific Ocean, and east by the Gulf of California. Its area is over 60,000 square miles. Its capital is La Paz, which is the principal town. The whole of the center is traversed by a volcanic range of mountains of the Sierra Nevada. It is bounded on the north by California and north-east by the Colorado River, dividing it from Sonora.

The soil is generally not productive, though, at the base of the mountains and in small valleys, where the decomposition of lava has been going on for ages, it possesses an incredible fecundity. The formation of the whole State is volcanic, and the coast subject to storms. The scarcity of rivers bars much of its prosperity.

The productions are maize, manioc, wheat, beans, etc.; grapes, from which wine of a very rich flavor is produced; oranges, limes, lemons, citrons, prunes, dates, figs, pine-apples, bananas, plantains, and other tropical fruits; stock of various kinds graze in the valleys, consisting of horses, sheep, cattle, goats and hogs. Fish, in its waters, abound to a great extent, such as halibut, salmon, turbot, skate, pilchard, large oysters, thornback, mackerel, cod, lobsters, etc., and pearl oysters.

The pearl fishery is much pursued at La Paz. In this region, a gold mine has been worked to some extent. There are about 30 towns in the state, six bays on the east coast and ten on the west, twelve islands in the gulf, and eight west of the coast.

The territory of Lower California is divided into eight municipalities—La Paz, San José de Comondu, Mulege, Santo Tomas, San Antonio, Todos Santos, Santiago, San José del Cabo. Population, 25,000.

La Paz, the capital, has about 3,000 inhabitants

This territory is about to be colonized, as we learn from the "Diario Oficial" that a contract has been signed by the Acting Secretary of Public Works, in virtue whereof, Messrs. J. Kelly & Co., of Mazatlan, engage themselves to colonize 36 000 hectares of public lands in Lower California.

SONORA.

CHAPTER I.

Boundaries and General Description.

The name of Sonora is derived from "Sonot," a Papajo Indian name, which means "Señora," an appellation bestowed by the Spanish conquerors upon an Indian woman who treated them with great hospitality, when they visited the settlements of that tribe. The Indians, in attempting to imitate the Spaniards, pronounced the word "Sonora."

The State comprises nine districts: Hermosillo, at which is located the capital; Ures, the former capital; Guaymas, Alamos, Magdalena, Altar, Oposura or Moctezuma and Sahuaripa. The state originally extended its boundaries from the river "de las Cañas" on the south, to the river Gila on the north. The southern boundary extended then from the state of Jalisco on the south to Arizona, and included a part of the same. Yuma, with Tucson and other towns and ranchos south of the river Gila, were originally included in the state. The state was then 1,395 miles in length, but in 1830 it was divided, and the south-eastern boundary fixed 54 miles south of the city of Alamos, on the border of the Mesquite rancho. This constituted the dividing line between the states of Sonora and Sinaloa; the distance from the former capital, Ures, to the southern boundary being 354 miles. The northern boundary extended to the Gila River, until the boundary line between the United States and Mexico was fixed south of the same river.

The length of the state is about 700 miles. Mean breadth from the state of Chihuahua on the east to the Gulf of California on the west is about 300 miles. The exact measurement is not known, as the state has never been completely surveyed. The most narrow breadth between Mesquite and Alamos is about 120 miles. The area in square miles is about 123,466.

The general direction of the state is from north-west to

south-east, along the Gulf of California. Its whole western boundary, from the mouth of the river Colorado on the north, extends along the coast south-east to Sinaloa. It is bounded on the north by Arizona and New Mexico. Along the coast the surface is diversified by valleys, plains, and foot-hills. Some of the plains are 30 to 40 miles, some reaching to 90 miles, in extent. In the neighborhood of the Sierra Madre mountains it is lofty and broken. The surface may be said to possess three distinct features outside of the mountainous district. First, dry plains; second, elevated plateaus, or table lands; and third, agricultural valleys, or bottom lands. The dry plains are located in the north-western part of the state, between the head-waters of the Gulf of California, and the valley of Santa Cruz, bordering upon Arizona in the north. The table lands lie in the north-eastern part of the state, extending from the Santa Cruz valley and the source of the Bapetito River, the main branch of the Yaqui on the west, to the base of the Sierra Madre mountains, which extend along the boundary line between the state and Chihuahua.

From Guaymas to the northern border line, the surface is generally level, diversified here and there by isolated mountains, conical or table-topped, which give grandeur to the landscape, without occupying much arable area. The soil is of great depth and richness, resembling in many localities the famous *brazos* of Texas, but happily exempt from the malarías of the latter.

In the interior, plains and valleys of immense extent are crossed by the traveler, in some instances 200 miles in length. The largest river of the state is the Yaqui, or Buenavista, which is only navigable for flat-boats in high water. The river Mayo may also be mentioned. Both of these rivers empty into the Gulf of California. The source of each is in the copious springs of the Sierra Madre, and they are never dry in the seasons of most drought.

The river Sonora or Arispe passes through Ures and Hermosillo, and loses its waters in the sandy plains of Siete Cerros, about 21 miles west of Hermosillo. The Horcasitas, or Rayon, a small stream, joins the Sonora about five miles east of Hermosillo. The same stream is also called Opodepe and Cucurpe. The Oposura, Aribechi, Santa Cruz, San José de Pimas, Tecoripa, Altar, and Caborca, are mere creeks, fordable when their waters are high, and almost entirely disappear in dry seasons, some of them entirely sinking in the sands. The Colorado River on the north-west ex-

tends along but a small part of the boundary. There are many sand-plains along the coast, as well as large sterile tracts in the interior, and only on the banks of the streams or river bottoms are the lands capable of irrigation. The principal sand-plain extends from the mouth of the Colorado to the Salinas Bay near port La Libertad.

The only port suitable for commerce is that of Guaymas, to which we will call particular attention hereafter. Some trade is also done at La Libertad. In Santa Cruz de Mayo, of the department of Alamos, in the southern part of the state, there is a small bay or roadstead called the port of Santa Cruz.

That portion lying between Mesquite on the south along the base of the Sierra Madre, extending north to the ancient capital city Arispe, is sterile in places, but has never been completely explored by surveying or civil engineers, while the region further north is, in places, very fertile. This territory will demand a more particular description hereafter. The most valuable agricultural lands are situated on the banks of the rivers and creeks, or river bottoms. Irrigation is necessary for almost the entire territory, either natural or artificial. The yield in this case is vastly greater than is produced in countries where the sole dependence is rain. The dry plains are generally level, with a hard surface, and adapted for purposes of wagon-roads and railroads. Experience has shown that artesian well-water may be obtained. The arid spots cannot be cultivated. The tablelands are covered with a short and luxuriant grass, upon which immense herds of cattle have been and may still be raised.

We herewith give the following from the pen of an able Spanish writer, Velasco, who impartially describes the state, in his valuable work on Sonora, which has been translated by Mr. Nye. Page 14:

"The most thickly settled places are upon the banks of the rivers and creeks, while at the interior settlements between Alamos and Hermosillo there is so great a scarcity of water on the roads that the traveler is compelled to carry a supply with him. It is not uncommon to travel eight or even sixteen leagues, (about three miles to the league) without finding a stream or a place where water may be procured by digging. On that part of the coast called Tiburon, to the west of Hermosillo, the distance between watering-places is still greater, and the supply more scanty, and on the old road of Cieneguilla, which is from fifty to sixty leagues in length,

there are but three watering-places, including one well. On the road from Hermosillo to the port of Guaymas, in the dry season, no water is to be had for thirty-six leagues, except at La Posa and La Cieneguilla, and it is occasionally so scarce at these places that foot passengers perish from thirst. The coast is so dry that the rancheros have sunk wells in different parts of it, thirty and forty yards in depth, without finding moisture. The region between Arispe and the Gila, however, is well watered by numerous creeks, and abounds in pools and swamps, and the mountains are well supplied with water, and timber of various kinds, such as cedar, pine, evergreen oak, ebony, etc.; well stocked with deer and birds, and containing medicinal herbs of marvelous efficacy, one of which, called '*colorada*,' is used by the Apaches for the treatment of wounds. The valleys are expansive and beautiful, abundantly watered, and clothed in verdure during the entire year; and nature has lavished her vegetable and mineral wealth upon these frontier regions with so prodigal a hand that they may well be called the Paradise of Sonora. The inscrutable decree of the Almighty has bestowed them upon savages, incapable of appreciating or enjoying his munificent gift."

Thus we see the region north-east and bordering upon the State of Chihuahua, outside of the valleys of the Yaqui and Mayo rivers, is the best portion of the state, and includes the valleys and foot-hills of the Sierra Madre. In this region there are now many cattle-ranches of large extent, that may be purchased at very low rates, we should judge, taking our data from the prices prevailing in Sonora. The mineral belt also extends through this region, including valuable mines of gold and silver, galena and coal, to which we will give a more extensive description hereafter, under the title of "Mining Districts and Mines."

CHAPTER II.

1. Climate.

The climate is varied in the mountain region from extreme heat to the freezing point. In the winter season, the cold weather commences in the latter part of October, and reaches the lowest degree, or freezing point, from Novem-

ber to March. Ice sometimes appears in October, but not usually till November or December. In the settlements nearest the mountains the frosts set in earlier than in the interior. In the latter region, three or four years often pass without any frost, especially near the coast. This is true of Hermosillo, Buena Vista, Alamos, and in the valleys of the rivers Yaqui and Mayo. The warm season commences in May, and the heat becomes extreme during the months of June, July, and August.

At Hermosillo, Guaymas, Ures, Buena Vista, and San Antonio de la Huerta, the mercury reaches above one hundred degrees during the months last mentioned. In September refreshing rains fall, and continue during the winter season. A hot wind occasionally visits Hermosillo during the months of June, July, and August, which blows from eleven in the morning till four in the afternoon, during which hours business practically ceases. The inhabitants seek shelter in their houses, and no one ventures forth unless driven by necessity. These hot winds are a terror to the Sonorians, and they remember, with some degree of apprehension, a time in which the wind scorched the skin like the heat of a furnace, and drove the hares, deer, coyotes, and other wild animals to the settlements for refuge, while plants and trees were literally scorched out at the root. This "*caliente pedo*," or hot wind, also springs upon Guaymas suddenly sometimes, and blows for twenty-four hours without intermission. On reaching the coast it meets the damp and cooler atmosphere, and by the time it passes about three miles over the gulf, its heat is absorbed, and it vanishes. Water may be kept cool, however, in jars, even during the prevalence of this wind. In the beginning of June the poorer classes abandon the interior of their adobe houses, and sleep in the corridors or court-yards. Others often sleep in the streets before their doors, for the heat is insufferable within their houses.

At Hermosillo and some other towns a southern breeze springs up about eight o'clock, and continues during the night, making the attempt to sleep more bearable; but, if the breeze fails to put in an appearance, the sleepy god is courted in vain. At Arispe, Bacuachi, and Fronterras, the winter lasts longer than the summer; and at Santa Cruz, near the northern boundary of the state, the altitude of the surrounding mountains is such, that the temperature varies from the cool and pleasant to the freezing point. Serious epidemics are unknown; and at Hermosillo the only dis-

eases that prevail, and that to a limited extent, are phthisis and diarrhea. On the rivers Oposura and Sahuaripa, "goitre," or swelled neck, appears on the necks of men, but mostly on the women. The disease is called "*buche*" by the Spaniards. Intermittent fevers often prevail, probably caused by the immoderate use of fruit, in the interior; but they are of short continuance. We may justly affirm that the climate is, on the whole, salubrious, and is really more healthy than that of the adjoining States, or the central part of the republic. The atmosphere is pure and dry, entirely free from malaria, with but one exception, in the neighborhood of Santa Cruz, where the adjacent swamps sometimes induce fever. The interior of the State is entirely free from noxious vapors. The air is pure and healthy, sweeping over the plains and through valleys from the sierras and the sea.

In Guaymas, Matape, Horcositas, Arispe, and Altar, persons are found who have attained to ages ranging over a century. The average duration of life, with the observance of prudence and temperance, ranges from seventy to eighty years, says Velasco. "Owing to the practice of vaccination, small-pox rarely makes its appearance. Venereal diseases are not common, except in the neighborhood of the rivers Yaqui and Mayo, and on the coast. Catarrhs frequently appear in a mild form during the changes of the seasons. One may sleep in the open air with perfect impunity, and experience no inconvenience. The diseases that affect children are diarrhea, intermittent fevers, vomiting, ophthalmia, eruptions of the face, and other difficulties that accompany teething. These diseases, owing to the lack of medical skill, produce a mortality among children that carries off one-fourth from birth up to the period of teething, annually. After this critical period, good health generally attends them to the age of puberty."

2. Soil and Productions.

The soil along the coast, from the valley or delta of the Colorado to the Altar or Magdalena River, is mostly unfit for productions of any kind, and the land south of the Altar River is used for grazing purposes, from the port of La Libertad on the coast, in places where the sand plains are not prevalent, to the Yaqui River. The exceptions are on the Altar or Magdalena Creek or river and its branch the San Ignacio, and the river Sonora. Wherever no streams exist,

it may be safely said the soil cannot be cultivated. Very good grazing lands are found occasionally, from La Libertad to Guaymas or in its neighborhood. On the San Ignacio, sweet and sour oranges, lemons, citrons, limes, pomegranates, and peaches are raised. The territory between the San Ignacio and the river Altar, produces cotton of excellent quality. Several large plantations are in this vicinity, one of which is devoted to the raising of this valuable production. Cotton-mills are here erected, owned by the Ortizes of Hermosillo. Also the "guava" is cultivated, and the plantain-tree attains a large size, bearing a heavy burden of fruit.

In and around the territory of Hermosillo large vineyards are located, from which considerable quantities of "*aguardiente*" or brandy and wine are produced. Wheat is also grown in this locality, with beans, lentils, Chili peppers, garlic, onions, and sweet potatoes. The fruits are abundant, and the grape, muskmelons, and watermelons, are raised of excellent quality. Orchards containing figs, apples, peaches, pears, apricots, etc., are found in this neighborhood. Cotton was first experimented upon in 1811, but was soon after abandoned, and was again continued in 1842, and carried on up to the present time at from 12 to 20 miles west of Hermosillo, on the plantations of Tennaje and Palomos, and at Chino Gordo, 12 miles east. Sugar is produced from the cane, on the coast near the Yaqui River, and at San Ignacio and Ceris. The average yield of wheat is 250 to 300 from one bushel sown, upon the haciendas of Messrs. Antisernes, called the Topahui, and upon the haciendas of Hermosillo it rates from 150 to 175 from one. Indian corn and beans are extensively grown at San Antonio, Santa Rosa, on the rivers Sonora and Yaqui and Santa Cruz, and other localities. The bottom lands of the Yaqui, Mayo, and lands bordering upon the Sonora and Santa Cruz rivers, produce wheat, also. On the river Yaqui, beans, lentils, sugar-cane, cotton, flax, indigo plant, coffee, tobacco, and various kinds of fruits, are raised. Sheep and cattle and horses in immense herds are raised, as well as many domestic fowls. The tobacco has a narrow leaf, owing to the lack of proper cultivation.

Extensive salt-pits are also situated near the mouth of the river Yaqui, on the coast. In the same place, and in the mouth of the river Yaqui, are located the great oyster-beds of common and pearl oysters. The distance from Coccori to Cochori is about 90 miles, across the valley of the river Yaqui. The whole of this tract of land is susceptible of a

high degree of cultivation. We will give, hereafter, a special description of this region. The soil is here moist and alluvial, capable of raising all the productions of the temperate and tropic zones. The irrigation is produced by annual overflows of the river, and suffices for the production of wheat, maize, and every class of productions yet experimented upon. This section may well be compared to the rich lands of Egypt lying along the banks of the Nile. Immense sugar plantations may be here established, and produce fortunes for the possessor. The best portion of this land has been granted by the republic to a gentleman residing in Mexico. Near Altar, on the Magdalena or Altar river, pomegranates, figs, and grapes are raised, and immense herds of horses and cattle are seen grazing in the vicinity; also extensive ranchos that are exceedingly fertile are here located.

In the northern part of the state, near Santa Cruz, is located a beautiful valley, clothed in verdure the year round. It is well watered by the Santa Cruz River, that takes its rise from a perpetual spring located to the north of the valley. Immense quantities of stock are here raised, and all kinds of grain, especially wheat, which is of excellent quality. It also produces the best red pepper of the state, and its hides find a ready market. The distance from Santa Cruz to Villa de Guadalupe, by way of Occua, Santa Ana, Santa Marta, San Lorenzo, and Magdalena, is 120 miles. When heavy clothing is necessary at Santa Cruz, other parts of the state are subjected to immense heat. Many swamps are in the vicinity, which produce fevers.

The Presidio of Bacuachi raises cattle, sheep, and horses, and produces good wheat, which is mostly grown, owing to the early frosts. Near the Presidio of Fronteras, the lands produce excellent wheat, maize, etc.; also, delicious peaches, apples, and the famous bergamot pear. A creek runs through this valley, which is used to irrigate the neighboring lands. Wild game is abundant in the neighborhood. The plains adjacent are all fertile and well watered. The climate is cool and healthy; and would be an excellent place to establish a colony. Indeed, the whole of the north-eastern part of the state presents advantages that no other part of the state combines. It is well timbered, has abundance of water, and is one of the richest mineral regions of the state.

To convince one of the remarkable resources of the state, a visit to the Hacienda de la Alameta, fifteen miles from Hermosillo, owned formerly by the Artazernes, will be suf-

ficient to satisfy the most skeptical. On the Alameta are miles of wheat, corn, and sugar-cane, and cotton. On this hacienda is erected a flour-mill of the best description, with abundance of water power, and a sugar-mill and works, a manufactory of blankets—the wool of which, and the dye-stuffs, are grown on the place. A wagon manufactory, carried on for the sole use of the hacienda, is also located in its limits. Tobacco also is produced of excellent quality. Oranges, lemons, pomegranates, and other tropical fruits of delicious flavor are grown in abundance. These places are simply principalities, where a man has all the products of the earth under tribute and at hand. The large cotton-mill near La Labor, at San Miguel, was offered to San Francisco capitalists on liberal terms, but was purchased by the Ortizes of Hermosillo. The cotton is raised at its very door. Indigo, brazil-wood, cochineal, and other dye-stuffs, grow spontaneously on the Yaqui and Mayo rivers; also coffee of the best quality.

The agricultural resources we thus see are rich beyond that of any state in the Republic of Mexico. If the state were well settled by an energetic class of immigrants, the future of this famous state would be of the most flattering character. We anticipate just such an immigration on the completion of the Southern Pacific and Santa Fé Railroads. We shall hereafter give some attention to the railroads of the state.

CHAPTER III.

Guaymas.

The port of Guaymas is situated on the Gulf of California, about sixty miles above the mouth of the river Yaqui, in latitude 27 deg. 22 min. north, and longitude 104 deg. 30 min. west of Cadiz. It is completely sheltered from the sea, and is one of the best harbors on the Pacific. The entrance runs north and south, and is formed by the island of Pajaras on the east, and the islands of San Vicente, Pitayas, and Tierra Firma on the west. There is also another entrance, called Boca Chica, formed by the island of Pajaras on the south, and the beach of Cochin on the north. The length of the bay is from four to five miles. The bottom is muddy, and

when vessels remain for some time it is necessary to sight the anchor every fortnight. The depth of water at the island of Pajaras is seven fathoms, which gradually decreases to two, along the side of the mole. The latter, according to the opinion of mariners, is one of the best on the Pacific, excepting that of Callao. The depth of water at the anchorage is three fathoms; and vessels drawing fifteen feet are loaded, discharged, and hove down with facility. There are three landing-places, but no fortifications, although there are several points well suited to the purpose. The tides are irregular and uncertain, being influenced by the winds from the gulf. In time of full and new moon they rise and fall eighteen to twenty inches; and in the autumnal equinox, about four feet. Sailing-vessels are often delayed by calms in passing up the gulf to reach the harbor; but since the era of steamships has arrived, it will have no appreciable effect on the commerce of the port, save only with sailing-vessels. The harbor abounds in various kinds of delicate fish and shell-fish. The latter comprises the shrimp, crab, lobster, oyster, and mussels of different kinds. The town is situated on the north of the bay, and is surrounded by a range of hills of moderate height, which leaves but one single entrance from the land side. There is but one principal street, called "Calle Principal," from the entrance to the Plaza; the others being short and narrow. The soil is dry and rocky. The climate is not severe in winter; but the north and north-west winds blow with great violence, and cause much inconvenience. The summer heat is excessive; the thermometer occasionally rising up to 104 deg. in the shade, and never falling below 90 deg., from June to September; and when the north wind blows during this season from the dry and parched land lying adjacent and north of the city, it is so dry and parching in its effects that it ruins the finer articles of furniture. The health of the place is good. Water, for drinking, is drawn from four public wells on the skirts of the town, which is carried in carts and on the backs of donkeys, in leather bags. There are no trees in Guaymas but a few stunted ones in the Plaza. In the suburbs is a large orange-grove planted by Mr. John A. Robinson of this city, who resided some fifty years in Sonora. The grove is now owned by Mr. N. Graff, of Guaymas. Wood is scarce, and is brought from nine to fifteen miles from the interior; also from the river Yaqui in boats, by the Indians, and constitutes the only fuel; it is sold by the "carga," or load. There are two kinds of carga—the

“burro,” or donkey carga of 150 pounds; and “mule” carga of 300; 50 sticks, or billets, as thick as the wrist, are counted out, 18 inches long, for the “burro” carga, and sell for 25 cents per carga; and the same number of twice that length for the “mule” carga, and a corresponding price is demanded. The wagons used are the latest improved, although one sees occasionally the awkward cart coming in from the ranchos with wheels hewed or sawed off the end of a log. The houses are mostly adobe, with here and there a substantial brick building. There are about one-half dozen wholesale importing houses, and quite a number of retail houses. The former import direct from Europe and the United States. Lumber is scarce, and is brought from San Francisco and Puget Sound. It sells from thirty to fifty dollars per thousand. Lumber is admitted free of duty. There are no banks either in Guaymas or in the State of Sonora; and business is carried on with foreigners by ordinary bills of credit, and by drafts on San Francisco, London, Hamburg, and Paris banks. The principal business firms are Aguilar & Co., Sandoval & Bulle, Domingo Carrez, G. B. Fourcade, W. Iberri, Arvillez & Co., J. J. Rodgers, Luis Jarequi, Ramon Carrizosa, Aguayo Bros., Echiquyen & Escobos, and some others, who do a large wholesale as well as retail trade.

An agency of Wells Fargo is the only American institution finding a foothold in Sonora. The American Consul is also stationed at Guaymas. There are quite a number of hotels, among which might be mentioned, “Cosmopolitan” and “Hotel de Guaymas.”

There is also a shoe manufactory, a soap factory, an ice factory, one Roman Catholic church, and public and private schools. It is not generally known that compulsory education is one of the Mexican institutions. Courts of the first and second instance, a hospital, and a railroad depot, are also found in Guaymas, of A. T. & S. F. R. R. The population is about 5,000. The Atchinson, Topeka, and Santa Fé Railroad, called the Sonora Railway, commences at Ardilla Island, so called, and runs north, crossing a bridge across a portion of the bay near the old rancho of Guaymas. The land is level beyond this point for ten miles, and no grading is necessary. The rails are laid this distance, and the road graded 30 to 50 miles further. The company are under contract to complete the road to Hermosillo by the 1st of March. We are told the trains between Hermosillo and Guaymas will be running by the middle of March next, a distance of 100 miles.

East of the town, the country is more adapted to agriculture and grazing. East and south-east, commencing about sixty miles distant, are located the rich bottom lands of the Yaqui River, which supply the town with fowls, sheep, and grain. Flour and meat are brought from the interior; San Antonio and Santa Rosa furnishing corn and beans for the Guaymas market. Hides and bullion, flour, and, in fact, nearly all the exports of the state, are shipped at this point. There are two Justices of the Peace, a judge of the first instance, and a prefect and board of aldermen. The custom-house is very much lacking in store-houses and offices. The future of Guaymas is yet to come, through the energy and industry of foreign capitalists and immigrants. This will remain the port of the state on the gulf, and it will hold its influence upon the commercial relations of Sonora. It will eventually be the most important town in the state. The railroad will soon connect it with San Francisco and the East. Another road is in contemplation, connecting it with Mazatlan in the state of Sinaloa, and from thence to the City of Mexico, which we will notice more particularly hereafter. A new port, La Libertad, above Guaymas, has been opened, giving an immediate outlet to the valuable district of Altar and north-eastern Sonora. A considerable amount of eastern capital has been invested in Guaymas and landed property adjacent. The foundries of San Francisco are turning out engines, mills, and costly machinery for the several mines owned in part here. The steamship lines established between San Francisco and Guaymas and Mazatlan are carrying this machinery to those ports, and from there transported to the interior. A new steamer has lately been built for the gulf trade above Guaymas.

Alamos.

The city of Alamos is situated some 240 miles south-east from the port of Guaymas, on the direct road by way of Buena Vista, on the Yaqui River. The town is situated in a rolling or hilly country, at the base of the Sierra Madre mountains, and is devoted principally to the mines in the vicinity, furnishing supplies to all the surrounding region. The population is about 5,000. We will give a more particular description of the mines in this district hereafter.

There is much business done here with Chihuahua, and the northern part of Sinaloa. The principal business houses are Thomas Robinson Bours, Vincente Ortiz & Hijos, and A. Goycoolea & Co.

Altar.

Altar is a small mining town of about 2,500 inhabitants, and was formerly called Santa Gertrudis del Altar, and it is sometimes now called Guadalupe. It is watered by a small stream called Rio de la Assumpcion, branching from the Altar or Magdalena river. The stream is insufficient for irrigation in the dry season. The town is situated near the banks of the stream upon a plain about 80 miles northeast from the gulf coast, and about 100 miles from La Libertad, which is located southeast on the coast. The plains on the west are dry and sandy, and are a part of the great Colorado desert, which extends down the coast near Lobos, about 50 miles distant in a south-west direction. The discovery of mines of gold and silver in the vicinity of Altar gave it a great impetus at one period in its history. It is mostly built of adobe houses, and contains several retail shops, one church, two justices of the peace, a prefect, and judge of the first instance. The town is garrisoned by a few soldiers, and the streets are irregular. East of the town are situated ranchos exceedingly fertile and abundantly watered. The place is distant from Santa Cruz about 120 miles, which lies in a north-east direction by way of Magdalena and Arispe. Santa Magdalena is about 70 miles distant. The latter town is also called San Ignacio, and is located due east of Altar, in a beautiful valley. The number of inhabitants is about 3,000.

The stage connects at Magdalena with Hermosillo on the south-east and thence to Guaymas, and on the north with Tucson by way of Tombstone and Benson, Arizona.

Hermosillo.

Hermosillo is the largest town in the State and numbers about 12,000 inhabitants. It is situated in a valley about three and a half leagues, or about ten miles in length and five in breadth, sheltered on the north by valleys, hills, and on the west by the range of hills called "Chanate," and on the east by the "Cerro de la Campana"—hill of the bell—so-called because its rocks, when struck together, produce a sound similar to that of a bell. The base of this hill is bathed by a small stream or river called the Sonora, running from east to west, which is sufficient to irrigate the lands between San Juanica and Chanate, cultivated by the inhabitants of the city, and of the pueblo of Ceris, which is

in sight to the south; the said lands being in length, from east to west, 12 to 15 miles.

A large aqueduct passes through the middle of the settlement, which serves for irrigating the neighboring lands. Another passes near the river and the Cerro de la Campana, and a third divides the city north and south, furnishing water to the houses and orchards of orange, citron, lime, and fig trees, pomegranates and peach trees in the neighborhood, as well as immense fields of wheat, corn, and other cereals. The average annual quantity of its agricultural products reaches to about 70,000 bushels of wheat and about 300,000 bushels of Indian corn, and an immense quantity of other cereals. Large vineyards of grapes, from which brandy and wine are produced, and plantain trees of enormous growth, mingle with the rich landscape. The wine produced is hard to keep, owing to its tendency to sour, and it is mostly manufactured into brandy or aguadiente. The Tonnage and Palomos cotton plantations are located from twelve to twenty miles west of the city, and at the Chino Gordo, about twelve miles east. Sugar-cane has not been very successfully grown in this vicinity; but at San Juanica and Ceris it is raised in small quantities. The capital of the State is located here, and the Legislature meets biennially, the same as under the Constitution of California. The Constitution of the State of Sonora is mostly copied from the old Constitution of California. The streets of the city are kept clean and are well paved. The principal street is called the "Calle Principal," the same as in Guaymas. The public buildings are, the capitol, the mint, the assayer's office, and municipal buildings, including the prison and public school, and one or two churches. The school is held in a building purchased by the city, and consists of two departments, male and female. The number of pupils is about 600. Public examinations are held every six months.

There are several hotels. The principal ones are, the "Iturbide," "Nacional," "Cinco de Mayo," and "Cosmopolitan." All are one-story adobes, with a court in the center, where the guests are obliged to sleep in the summer season. The houses are nearly all one-story adobe buildings, with occasional brick residences and buildings. A new Catholic church is in course of construction. The principal plaza, in front of the church, is the most attractive feature of the city, and is set with orange trees and evergreens and covered with lawn grass, with enticing paths,

meandering through flower beds, and bordered with orange trees, which afford an excellent shade. It is kept open all the time, and is provided with convenient seats for the leisure-taking Sonorians. An eye-witness pronounces it, in "size, beauty, and arrangement, as excelling any in San Francisco." The whole is surrounded with a very pretty iron fence. In the center is a grand stand, from which music is wafted upon the evening breeze Thursday and Saturday nights, on which occasions it is the favorite resort of the people of the city. The ladies of Sonora are very beautiful, and, indeed, the town is known as the place of beautiful women.

The ladies of Hermosillo of the higher class never go on the street with their faces uncovered. The "mantilla" of rich and gorgeous material is very gracefully thrown over the head, and one portion, with that indescribable drapery for which the Spanish ladies are noted, is carelessly thrown across the lower part of the face, concealing the features, and over the shoulder, while the beautiful eyes, some lustrous black and others of blue, only are revealed to the gaze of the spectator, as they float along with that grace of carriage and modest demeanor for which the Spanish ladies are so celebrated. The latest styles from Paris are ordered, and Worth has many customers throughout the republic. The descendants of the ancient Castilians are to be seen in blondes as well as brunettes; and although the taste of the people is generally in favor of bright colors, still fashion has been wielding her scepter in Mexico as well as in the United States.

Hermosillo is celebrated, as well as the rest of the state, for the fecundity of its women. It is not unusual to see a family with from 15 to 25 children. As an instance in point, there is a lady residing in Hermosillo weighing 260 pounds, tall and handsome withal, in spite of her corpulence, who is the last of a family of 28 children. This fact is vouched for by a well-known citizen of this city. Another gentleman, an American by birth, and at one time a prominent citizen of Guaymas, but now residing in this city, married a Spanish or Mexican lady, and is the fortunate father of no less than 17 children. The children of Sonora go almost naked, and thrive remarkably well, since the statement of Velasco that there is a great mortality among children, to which we have already referred. The prominent citizens even dress their children only with a shirt, hat, and boots.

The business of the place is confined to the port of Guay-

mas and the interior of the state. There are about 30 shops and mercantile establishments in the city. The town is the favorite resort for travelers through the state. The principal business men of the place are the Ortizes, Camous, Pesquiera, Ruix & Mascareñas, Carlos Maneti, Alvistiqui & Alatorre, and Antonio Calderon. Most of these business houses import direct from Europe and the United States. The houses of Ortiz and the Camou Bros. are probably as strong financially as any in the republic. The Ortizes, besides owning a large number of haciendas, comprising several hundred thousand acres, stocked with immense herds of cattle and horses and flocks of sheep, and several of the best mining properties of the state, own the large cotton-mill, called "Industria Sonorense," which employs about 300 men and women; also a sugar-mill and tannery. All these mills are located at Los Angeles, on the San Miguel River. The Camou Bros. own several large haciendas, also, with their thousands of cattle and horses, mules, sheep, and large mines. They also own the steam flour-mill, located at the city of Hermosillo, and another at El Molino Rancho. The town of Hermosillo is orderly, and the police regulations good. There is a very good market-place for the sale of meat and vegetables, but no bakeries, such as are seen in the United States, in the city. Water is found in abundance in wells, at the depth of 20 or 30 feet. Wood is plentiful, and brought from the timber, about two or three miles distant. A natural cement stone is within the town limits, that is easily quarried, being soft, until it hardens on exposure. It may be quarried and used for building purposes. There is also a fine clay, used in the manufacture of brick, in the vicinity. There is also a shoe factory and wagon factory, and plenty of carpenter and blacksmith shops, etc., worked by foreigners. Wardrobes and other pieces of furniture are manufactured in the town.

The railroad now being built from Guaymas will add to the business energy of the city, and its future is assured as the most important inland city in the State. There is a club in the city called the "Casion," of about one hundred members, of the principal citizens of the place, located in the former magnificent residence of Gov. Pesquiera; also a theater; and society is of the gayest during the sessions of the Legislature, when balls and receptions are quite frequent. There is no gas in the city; but an attempt is being made to organize a company for that purpose. The streets and houses are lighted by lamps. Señor Falizardo Torres is the

superintendent, and Mr. Edward Norman, is the cashier. We are informed that the mint here, the two mints of Sinaloa and the mints of Chihuahua and Durango are leased to Messrs. Simon & Co., of England, making five in all, or the mints of the four northern States. We also understand that they hold Mexican bonds to a heavy amount. Robt. Simon, of this firm, residing in New York, is said to be very influential with the Mexican government.

There are two stage lines running from Tucson to Hermosillo; one by Babasaqui and Altar, which is the longer route, and the stages are slower and are not in so good condition as the stages on the other route, though the fare is cheaper. The fare over this route, by buying the ticket at Tucson for Guaymas, that is, by way of Altar, is \$24. The other route is by way of Calabasas and Magdalena. The difference in price is not much; but the stages are better, and horses faster, insuring a quicker trip. The distance from Tucson to Hermosillo is about one hundred leagues, through Magdalena, and the ride is through a beautiful country; consequently this is the most popular route. A sixteen hours' ride from Hermosillo, reaches Guaymas, over about one hundred miles.

Immense herds of cattle are passed on the way, of from 5,000 to 10,000 head in each, handled by gaily-decked caballeros, who are fine riders, and very gracefully bestride very beautiful horses. They are very fine looking in appearance; and with their gaudy serapes and sombreros, are withal very prepossessing.

A writer to the *Farmer and Dealer*, San Francisco, says:

"The Sonora Railway, Limited, has already nearly 100 miles graded from Hermosillo, on their route to or near El Paso, where they connect with the Atcheson, Topeka and Santa Fé road, which gives direct railroad communication with Chicago and the East; 30 miles of steel rails on hand; track-laying has begun, and the locomotive whistle has already sounded the death-knell of the old ox-train transportation to and from Hermosillo, and I have no doubt the poor oxen will rejoice. The first of March next is the time set for the opening of the 100 miles of road. Another road, called the Mexican Central, from the capital to El Paso, has about 1,000 men employed at the southern end. These two roads will drain the whole country, and open to American enterprise a rich field for operation.

"Already, in anticipation of the future, American capital is flowing into Sonora; no less than six mines, ranging in

price from \$200,000 upwards, having been sold to New York and Chicago parties in the last six months, and more are coming every day.

"For the gold mine of Los Mulatos, \$1,000,000 has been refused."

The distance from Hermosillo to Ures is about fifty miles, situated north-east, and to Arispe, 150 miles north-east of Ures, and Santa Cruz, about 250 miles; thence 170 miles to Tucson by way of Magdalena, distant 300 miles, and is about 100 miles by stage from Guaymas.

Ures.

This town was formerly the capital of the State, and is situated in a most beautiful valley, stretching from east to west, the soil of which is exceedingly fertile and suitable for the production of all kinds of fruits, excellent wheat, sugarcane and cotton of superior quality. The environs are picturesque and pleasing to the eye of the visitor. It is located on the Sonora River, and on the road from Hermosillo and Alameda, a road lined with trees on each side similar to the Alameda between San José and Santa Clara in this State: the road in this instance being bordered with trees on either side for four miles, and presents an elegant drive for the residents of Ures.

The town originally was environed with numerous creeks that threatened it with inundations, when it was removed upon a neighboring plateau. The town is not so large as Hermosillo, yet its neat and elegant gardens of rare and beautiful flowers, lime, orange, and citron groves, make it a gem of a little city. There are some very substantial residences of brick scattered here and there among the adobe houses, and even elegant residences, among which may be mentioned Gov. Pesqueira's residence, handsomely furnished. A large orchard is attached to his residence and grounds, with orange, lime, lemon, peach, and olive trees bearing finely, besides an extensive vineyard.

Since the capital of the State was removed to Hermosillo the population has shrunk from 10,000 to 5,000. There is quite a rivalry between the two cities, and the dispute over the capital is not yet ended. If the Atchison, Topeka and Santa Fe Railroad passes up the Sonora river to El Paso, it will pass through this place. There is a vast agricultural and mining country around and adjacent to the city, and business is quite extensive. There are some heavy com-

mercial firms in the city, among which may be mentioned Lauro Morales, Joaquin Villaes, Cusa & Co., Francisco Hernandez, Manuel Morales & Co. and Francisco C. Aguilar. The climate is much cooler at Ures than at Hermosillo, and one is able to sleep within doors. Among the important haciendas of arable land may be mentioned, Santa Rita, Molino, Guadalupe, Topahui and others. There are no important public buildings except certain small houses purchased during the administration of General Urea to form a palace, a penitentiary or House of Correction. Excellent stone for building is in the neighborhood of the city. The principal hotel is the Gubion, kept by a Frenchman.

The Rancho of Gov. Pesquiera, called Las Delicias, is located about 60 miles distant by way of Canada Andia, El Puertecito, El Molinate, Soqui, San José, La Estancia, La Concha and Baviacora. The last named town was once an important place, with a population of 3,000, and is situated in a pretty little valley one mile from the Sonora River, in one of the most fertile and beautiful districts of the State.

The grounds of the hacienda of Las Delicias is fenced in and laid out with orange and lime groves and flower gardens, containing rare flowers. The hacienda consists of a little over 30,000 acres of arable land, and about one-fifth is first-class agricultural land, devoted to the raising of wheat, Indian corn, potatoes, etc.; the balance is very good grazing land, covered with alfalfa and gramma grass. It is situated in a valley of considerable extent. Gov. Pesquiera has made this hacienda his residence, owing to the existence of rich mines in the vicinity, which are owned by him, and demand his attention in working them.

Among the reptiles that are found in the State may be mentioned the scorpion, whose sting is deadly. Rumor says that they are more deadly in the interior than on the coast.

One citizen near Guaymas was recently bitten by one of these reptiles on the hand. He simply twisted a strong India-rubber band around his wrist to keep the poison from communicating to the rest of the system, and took some ammonia, and the wound soon healed, without any serious result following. Strong spirits are generally used to work off the virus from the system.

Santa Cruz is the most northern town of Sonora, distant about 120 miles from the boundary line of Chihuahua and ten to fifteen from the boundary line of Arizona, and situ-

ated on a road direct to Guadalupe or Altar, which passes through Occua, Santa Ana, Santa Marta, San Lorenzo, Santa Magdalena, or San Ignacio, Tenenate, Imuris, and San Lazaro. The population is about 800. The town is located in a beautiful valley, clothed in verdure the entire year, in latitude 32 degrees 15 minutes north, and in a region that is pronounced to be the best agricultural region of the State, outside of the bottom lands of the rivers Yaqui and Mayo. It is also the best timbered of any portion of the northern part of the state, and in other respects presents advantages to the settler. Indeed, the valley of Santa Cruz, with its adjacent districts, where there are several rich and highly-cultivated haciendas and missions, must become the future granary of Arizona. The Santa Cruz River rises in a broad valley, or rather plain, north of the town, and passes the base of a mountain range through an open country, studded with oaks, into an open plain covered with luxuriant grass, without tree or shrub. It then passes between a low range of hills into the valley where the town is located. The river then flows south nine miles to San Lorenzo—a considerable rancho—and then takes a northerly course, winding its way through a beautiful valley, until it is lost across the line into Arizona, in the desert plain or sands some ten or fifteen miles north of Tucson. It is about 150 miles in length. Its width varies from 20 to 100 feet, and during dry seasons portions of it disappear. This valley was traversed by the earliest Spanish explorers in 1535, seduced by the flattering accounts of Cabela de Vaca.

Marco de Niza and Coronado led their deluded adventurers through it in search of the famed cities of Cibola, north of the Gila River; and before 1600, its richness having been made known, it was soon after occupied as missionary ground. Remains of several of these missions still exist. The Mission Church of San Xavier del Bac, erected during the last century, was the finest edifice of the kind in Sonora. Tumacacori, a few miles south of Tubac, was the most extensive. The towns and settlements of the Santa Cruz valley, across the line, in Sonora, are, Santa Cruz and San Lorenzo. The lands of this valley are suitable for stock-raising and all kinds of grain, especially wheat, which is produced of excellent quality.

Bacuachi.

The town or Presidio of Bacuachi is located about 50 miles south-east from Santa Cruz, on the road to Arispe,

which is located on the Sonora River. It was at one time rich in cattle, sheep, and horses; but the Apaches swept them away, and the town became almost a heap of ruins. It is located in a very fertile valley, near the base of a range of mountains on the west, on the Sonora River, that rises in a valley north of the town and across the boundary line, in New Mexico. It also lies in a straight line drawn from the boundary line between Arizona and New Mexico, and is distant from the boundary line of the United States about 40 miles within or near the lower part of the prohibited belt. There are gold mines in the neighborhood of marvelous richness. The rich placers on the Sonora not being very distant, great quantities of this precious metal was extracted from the mines in the vicinity, of twenty-two carats fine. The miners were driven off by the Apaches, and the mines were, consequently, abandoned. The gold is coarse, and pieces have been found weighing twenty-five marcs. These mines might be made to yield a magnificent return if they were opened. The future of this mining district is just to open, since the suppression of the Apaches. A colony of miners will here find a rich field; for the whole region is rich in minerals, and but awaits the hands of man to develop their vast resources. This locality has been peculiarly exposed to the incursions of the Apaches, and for that reason, its mineral wealth has been withheld from the prospector. We predict a tremendous immigration to this point and all along the headwaters of the Yaqui River. The climate is cool and healthful, and epidemics or fevers are entirely unknown, while the soil is of the most fertile character, producing wheat, corn, etc., and presents a grazing region unexcelled anywhere; and there is an entire absence of swamps that are found in the Santa Cruz valley, which sometimes induce fevers. There are here two justices of the peace, subject to the sub-prefect of Arispe.

The town of Fronteras is situated in latitude 31 deg. N., north-east of Bacuachi, distant about 35 miles, and 20 miles from the boundary line of New Mexico. The town contains but one street, at the foot of a creek whose waters irrigate the neighboring lands, which produce excellent wheat, maize, etc; also, the delicious peaches for which Sonora is celebrated, apples, and bergamot pears. The town is situated 35 miles north-east of Bacuachi, and the greater part of the road is between dense thickets. This point was the most exposed to the Apaches of any in the State, but is now comparatively safe. The climate is cool and healthy,

timber is abundant, and game plentiful. The plains are fertile and well watered. Two justices of the peace are located here.

Bapispe is situated about 18 miles west of the boundary line of Chihuahua, on the banks of a small creek which empties into the river Baepito. It is isolated from all other towns, and is situated about 40 miles south of the boundary line of the United States at New Mexico, and east of Bacuachi about 90 miles.

The creek passing the town rises in a valley south-east of the town and flows north-west into a plain about 20 miles; then south-west into the Baepito, near Oputo. A road connects this town with Janos in Chihuahua, about 40 miles distant. This territory of the Bapispe district contains the towns of Guachinera and Baserac, and haciendas Santa Ana and Loreto; it formerly comprised a number of wealthy ranchos, but all have been despoiled by the Apaches. Bapispe possesses excellent grazing lands and abundance of water. The population is about 800. They are engaged principally in the manufacture of soap and leather. About six miles east is located a rich silver mine, that has not been worked much on account of the Apaches.

Arispe is situated south-west of Bacuachi, on the river Sonora, in a valley skirting an immense table-land or plain, and a range of mountains extending north-east and south-west. Extensive silver mines are located south-east in this range of mountains, called the Babiconicora and Banamiche; also, south-west, the San Rosalio mine is located, also of silver. The hacienda of Las Delicias, owned by General Pesquiera, is also situated south-west of Arispe. A road runs from Bacuachi along the river Sonora, in a south-westerly direction, through Bacadobabi, Chinapa, Guipaberachi, Ciniriasanta, Arispe, Bamori, Sinoquipe, Montepoort, Bamanitchi, Huepaca, Mochobavi, Aconche Babiadora, Concepcion, Puretecito, San Francisco, and Ures, distant about 100 miles. The same river passes Ures and Hermosillo in the same direction, until it is lost in the sandy plains on the coast, south-west of Hermosillo, and is about 200 miles long.

Moctezuma, or Oposura, is situated on the Soyopa River, in a large plain, that extends from the head-waters of the river Soyopa, which runs almost due south for about 100 miles, and then taking a south-easterly course, empties into the river Yaqui, about 20 miles further. A road runs from Moctezuma, down the Soyopa River to the Yaqui, and thence along the Yaqui to Comoripa and Buenavista. This plain

is one of the largest in the state, and over 100 miles in length, and about 40 miles wide at its widest point. In the mountain ranges west of the head-waters of the Baepito are situated the silver mines of El Pintos, Sesentero, San Pedro, El Rosario, Cinco Señora, El Humacal, and Plomosa. South-west of Soyopa, on this river, is located the Mina Prieta copper mine, and the silver mines of El Paste, and Los Brönces. East of the latter, the La Barranca, and the great gold mine called the San Antonio de la Huerta; the latter two of which are located near the mouth of the Soyopa River.

Sahuaripa is a small town located on a branch of the Baepito, east of the river of that name, and distant from Bacuachi about one hundred and fifty miles south-east by way of the road through Baepito and Oputo, crossing the branch of the river; thence south, along the Baepito, to Cienega, Guainipa, Iascotol, and crossing the Baepito to Huasavas; thence to Baca de Huachi, crossing again the same river; thence south-east to Nocori, on the river Viejo, which empties into the Baepito south-west about fifteen miles; thence to Palmar, Casa, San Gabrielle, through the silver mine of San Felipe to Sahuaripa.

This region is well watered, and abundance of timber is found in the mountains. Several large haciendas are also in the neighborhood, along the stream and between the two streams; the stream on the north being the Rio Viejo, which takes its rise in the same neighboring mountains on the east. North-east of Sahuaripa, distant about fifty miles, is located the great gold mines of Cieneguita and the silver mine called the Minas Prietas Viejas, both of which are located at the base of the mountains; the Cieneguita being north of the latter about fifteen miles.

A road runs direct from the town through a rancho to the Minas Prietas Viejas mine. This is a rich mineral region, and will ere long be completely settled.

The region north of these mines has never been completely explored, and has not yet known the tread of the American miner. The second main branch of the river Yaqui, called the Papigochi or Mulatos, runs south of this region, taking a north-easterly course and emptying into the Baepito about fifty miles south-west of Sahuaripa.

Gold placers are located east of Santa Cruz, about forty miles; and the mine of La Cananea south-east of Santa Cruz thirty miles; and the Santa Teresa silver mines and San Rafael Valle silver mines, forty miles south-west. The

Planchas de Plata silver mines are located west of Santa Cruz about fifty miles. The Altar mine, or mines surrounding Altar, are located in many districts. West of that place the gold mines of La Basura are located about seventy miles, and silver mines north-east of the same mine about ten miles. The Cajitos gold mines are located south-west of Altar about seventy miles; and south-west of La Basura, the placers of gold Micaray, and Alamo de San Feliz, silver, are also located about seventy miles; also, the silver mines of Los Palomos are located on the river Assumpcion, south-west of Altar about ninety miles, and about seventy miles north of La Libertad, on the coast. South of Altar about thirty miles, are located the Alamitos, silver, and La Tollena, gold mines, near. The Mina Grande silver mine is located about eighty miles south of Altar, and Latesote near Cienega, east about ten miles. Caborca gold mines are located near the same river. Rich gold placers are also found west of Altar on the elevated plains about one hundred miles distant; and the Quitovac gold mines, which were once rich, about one hundred and fifty miles north-west of Altar. So that the town may be said to be completely surrounded by mines.

Rivers Yaqui and Mayo.

The river Yaqui, or Buena Vista, rises in the Sierra Madre Maicova, and takes a south-westerly course through Bapispe, Todos Santos, the pueblo of Soyopa, Honavas, Tenichi, San Antonio and Comuripa, to the city of Buena Vista, where it enters the Yaqui settlement and finally empties into the Gulf of California, in front of the pueblo of Rahum. It has many branches, and may be said to drain all the region east of Arispe, Ures and Hermosillo, to the summit of the Sierra Madre range, which divides the states of Sonora and Chihuahua, and north of the river Mayo.

One of its branches called the Bapcito rises in the south-eastern portion of Arizona; and another called the Papi-gochi, or Mulatos, at the base of the Sierra Madre, across the boundary line in south-western Chihuahua. It is the largest river of the state, and is estimated to be four hundred miles in length, from its source to its mouth. Its waters pass through the richest agricultural portion of the state, and through immense placers of gold, and along the base of ledges of silver, copper, galena, and tin ores.

Its rich bottom lands are the most fertile of any in the state,

and raise in spots now under cultivation, wheat, sugar-cane, corn, cotton, the indigo plant, tobacco, and the various cereals. At and near its mouth, where the soil is not under cultivation, immense cane-brakes of a kind of bamboo extend along its banks for about sixty miles. If brought under control by proper agriculture, its valuable lands could produce immense quantities of all the products that an alluvial soil, well irrigated, will produce. The best portion of the lands are in possession of the Yaqui Indians, with some exceptions, but its lands are so extensive that after reserving sufficient for the Indians, millions of acres of arable lands would remain to be brought under cultivation.

Here is an opportunity for colonization that is unrivaled in the United States or the Republic of Mexico. The land is easily irrigated from the river, and would provide homes for colonization of a large population. In time of high water the river is navigable for small vessels for from fifty to seventy-five miles. Flour-mills are located on its banks, owned by foreigners—the result of foreign capital and energy. At its mouth are located the best oyster-beds on the coast of the gulf. We are assured by parties who have tested the qualities of these oysters, that they are equal to our best Eastern bivalves. San Francisco will soon have the pleasure of testing them on the completion of the Sonora Railway connecting Guaymas with San Francisco. Packed in ice manufactured at Guaymas, they can successfully be exported direct by rail to San Francisco, on the completion of the railroad, thus opening up a new avenue for some enterprising gentleman who will take the initiative. San Franciscans would like to try some of the Yaqui oysters if they are as represented. We understand that Dr. Charles McQuesten of this city, and Rafael Escobosa of Guaymas, are now the *bona fide* owners of these oyster beds, and the extent of their possession comprises one league square in the delta of the Yaqui at the old mouth. The oysters are found in the sloughs which extend from one to two miles inland.

The basin of this river at its widest point is about ninety miles wide. After the rains have ceased, the river is fordable, though still deep until the droughts in April, May and June. Near Soyopa, Buena Vista, and Honavas, are located a greater proportion of the best bottom lands. The salt-pits of the river, located near the coast, supply the interior towns, and are considered the property of the Yaquis. The annual overflow of the river supplies sufficient irrigation for one crop of wheat, maize, beans, len-

tils, and various kinds of fruit, at the points thus irrigated. Cotton, flax, and coffee, are also successfully raised. We are told by Velasco, the sheep raised upon its nutritious grasses attain the size of a yearling calf, and make excellent mutton. Beef cattle of the best quality are raised. At one time the Mission of Huirivis alone owned 40,000 head. The tobacco raised by the Indians upon the banks of this river is of very good quality; and the plant might, with proper cultivation, be equal to that of Havana. Immigration to this region must be of incalculable value to the state in the increase of its productions.

The river Mayo rises also in the Sierra Madre, and though it is smaller, and its bottom lands more narrow than those of the Yaqui, yet its fertility is the same, and may produce like results proportionate to the extent of its lands that are susceptible of cultivation. The Mayo Indians are located on its banks. The two rivers are separated by a low range of hills or mountains, and the intervening hills are good grazing lands. The pueblos of the Mayos, from the sierra on the east to Conicari on the west, are Macollagui in the sierra, Conicari, Camoa, Tecia, Nabajoa, Cuirimpo, Guitajoa, Echojoa, Santa Cruz, and Masiaca.

The Yaqui settlements extend from Buena Vista to Belen, over a territory of 84 miles in length. A brig might enter the mouth of the river Mayo, and a harbor is located at the port of Loreto, at this point. It was the first settlement of the gulf, and renowned for its pearl fishery, which has produced splendid fortunes. In the gulf, many large whales are sometimes caught, of various kinds; also, sharks of enormous size haunt its coasts, to the great danger of the pearl fishermen, who are Yaqui Indians. They always carry a long, keen knife with them while diving after pearls, to defend themselves. The "manta," or blanket fish, also, is another great enemy of theirs, and very formidable. It has fins like the arms of a man, says a writer, by which it seizes its prey.

The Presidio of Buenavista is located on the Yaqui River, on the main road to Alamos, about 300 miles from Arispe, by way of Hermosillo, and about 260 miles by way of the road of Matape, which runs along the banks of a stream by that name, south of Hermosillo. It is situated upon a small rocky promontory or hill, and is, consequently, very hot. It claims some importance as a military position, and is supposed to present a barrier against the revolt of the Yaquis and Mayo Indians. Its soldiers are poorly supplied and seldom paid.

The recent attempts to survey the lands of the Yaqui and Mayo rivers have been suspended, awaiting a petition from the Legislature of Sonora to the general government to supply a force of 1,000 soldiers to keep the Yaquis in subjection during the survey and location of certain government grants upon those rivers. For this purpose, a return grant by the owners to the general government of a portion of the lands is to be made to cover the expense of maintaining the military in this district.

The lands adjacent to the town are of the fertile character that belongs to the bottom lands of the Yaqui and Mayo rivers. From this point, the Yaqui River is navigable during the greater part of the year, and timber, grain, and other productions can easily be transported to Guaymas. Mines of gold and silver are located at Cumuripa, Cendradas and San Francisco de Borja, which, when worked, yield abundantly.

The current of the river is rapid at Buenavista and many other points. Ore might be transported from this place and shipped from Guaymas. Along the river, above Buenavista, there are hundreds of veins of gold and silver that could be worked profitably. The placers are located near this place, and are said to be very rich.

The town of San Pedro de la Conquista is situated south of Hermosillo, on the river Sonora, a short distance. Cattle and horses are here raised, and different kinds of grain grown. There have been no mines of any consequence discovered here. The land is well timbered with iron-wood, the mesquite, the huayacan, (a very solid and compact wood) and the huevito. An herb is here found, called the "confitura," which is much esteemed, as possessing medicinal qualities, and is said to be used as a specific for hydrophobia.

The land is fertile, producing wheat and Indian corn or maize, beans, pulse, lentils, Chili peppers, sweet potatoes, etc. Figs are raised in profusion, grapes, peaches, apricots, pomegranates, quinces, sweet and sour oranges, limes, citrons, and the guava.

Wheat is sown from October to December, and sometimes as late as January, and is harvested from May to July. Two crops of beans are raised annually. The first is planted in February or March, and the second in July and August. Two crops of corn are also sometimes raised, the most abundant being gathered in November and December. That gathered in July or August is generally of inferior

quality. Grain, flour, and other products are transported to Guaymas and other places, in wagons drawn by mules and oxen.

There are several grist-mills turned by water-power at this place, the best grinding from 25 to 30 cargas (of 300 lbs. each), in 24 hours. Sugar-cane is also raised. The climate is healthy, and the population about 1,200. The town has two justices of the peace, subject to the tribunal of first instance at Hermosillo.

The Indians and Presidios.

The Yaqui and Mayo Indians inhabit the cane-brakes on those rivers, and are depended upon mostly for laborers all through the state. They are not averse to labor, and are employed in every capacity. They possess remarkable natural abilities, and soon learn the trades of blacksmithing, carpentering, etc. They have been known to manufacture fireworks, and are skillful players on the harp and violin. Their character is resolute, and they are very jealous of their lands. They are generally copper-colored and well formed. The women are of medium height and corpulent. In some of the settlements, the women are exceedingly fair and handsome; but these latter are mostly half-breeds. The Yaqui, with few exceptions, has but few wants. A cotton shirt and drawers for the men, and shawl and petticoat for the women, suffices; while the children run naked, with the exception of a cloth around the loins. Their nature is joyous, and they are very fond of music and dancing. They are suspicious, and a supposition of deception serves as well as the reality. They have been known to revolt against the government and commit great atrocities. They are brave, and have been known to fight steadily for hours against the government troops. They shun the society of the whites, and only live near them for the sake of employment. Velasco says, "They will steal, gamble, and drink, and have no generosity or gratitude"—a rather peculiar trait for the Indian—yet they work in the mines, till the soil, build houses, and perform nearly all the labor of Sonora. They alone of all the Indians are skillful pearl-divers; but so "great is their love of robbery," says Francisco Velasco, an impartial Spanish writer, "that they abandon any occupation, however profitable, for the purpose of stealing cattle and horses from the ranchos in the neighborhood of the river. This they practice even in times of peace."

But Mr. Andrade tells us that this is not so at present. They have greatly improved since the writing of Velasco's book. Their population amounts to 13,500 in the state, according to Cubas.

The Mayos possess the same characteristics as the Yaquis. Being located on the Mayo, they are called Mayos. The Ceris are more allied to savages, are filthy, drunken, and bitterly hostile to the whites. They are located by the government upon the pueblo of San Pedro de la Conquista, where they have lands assigned to them for their support. They are lazy, and dress themselves in either the skins of the pelican or a coarse blanket wrapped around the waist. Some wear nothing but a strip of cloth about the loins, and none wear shoes. They paint their faces in black stripes, and many pierce the cartilages of the nose, and append to it pieces of a green stone resembling glass. The women perform the greater part of the labor, gathering the crops, etc. The men are tall, erect, and generally stout. The women are copper-colored, and wear a petticoat made of the pelican skin, with the feathers, which covers the form from the waist down. They worship the moon, and prostrate themselves, beating their breasts, and kiss the ground on the appearance of the new moon.

The Opatas are more frank and docile, and are friendly towards the whites, many of them serving as soldiers. They are brave to the last extremity, and have been known to withstand an onset of the Apaches outnumbered eight to one. They are just and humane in their dealings, and capable of a high degree of education. They are the bitter foes of the Apaches, showing them no mercy in an encounter.

The Opatas live in several of the towns, where the mixed race predominates, called Opodepe, Cucurpe, Suaque, Aconchi, Babiadora, Arivechi, Santo Tomas, Bacanora, and Nuri in the center; Oposura, Guayavas, Baca de Huachi, Nacori, Mochop, and Oputo in the sierra; Chinapa, Bacuachi, Cuquiarachi, and Cumpas, to the north. The Opatas are able-bodied, and as fleet as the game they pursue. Their haughty character is illustrated by the following, related by Cubas, of a band of them in rebellion: "Persecuted by General Gandara with very superior forces, in consequence of an insurrection, they refused to surrender themselves, even after each one at his post had shot his last arrow. Their captain, with some few who had survived the contest, took refuge on the summit of an almost inaccessible mount-

ain, and there awaited the approach of General Gandara's emissaries, who had intimated their submission. Believing themselves humiliated at the demand for the delivery of their arms, they declared to the envoys of the general their resolution to deliver themselves up to their conquerors, without abandoning their arms. Upon General Gandara's insisting in his demands, and they in their resolution, their conduct decided him to take them prisoners by force, which they avoided by an act worthy of the ancient Spartans, in throwing themselves over the precipice at the moment the general's troops were ascending the heights." The Opatas are most useful citizens, and have on many occasions proved their loyalty to the Mexican Government by resisting the attacks of the Apaches. They seldom go barefooted, every man has a blanket, and every woman a long scarf. They are good carpenters, masons, shoemakers, and house-painters, and manufacture blankets, shawls, coarse cottons, saddles, pack-saddles, bridles, etc., and considerable quantities of soap.

The Papajos are numerous, and located in the western part of the state, subsisting principally on wild fruits, especially the "pitaya," from which they manufacture a delicious syrup, and carry it to the settlements for sale in earthen jars. In the winter they resort to the settlements of La Pimeria to trade, exchanging skins and baskets. This tribe is also the sworn enemy of the Apaches.

The Apaches are divided into the Coyotes or Pinelores, the Tontos, Chiricahuis, Mimbrenos, Gilenos, Mescaleros, Sacramantenos, Mogollones, Carrizalleños, Gipanés, Faráones, and Navajoes. They have had no fixed habitation, and reside in the mountains and on the plains, and often make incursions into Sonora, near Altar and Magdalena, and also in the north-east, in the mountains of Chihuahua, near Janos, and in Coahuilla. They are the most savage of all the Indians of Mexico, and are exceedingly fleet, both in traversing the vast plains and in climbing the rugged eminences of the mountains; and, besides, are excellent horsemen. Their arms are mostly the bow and arrow; but some few have fire-arms, and a lance with a flint point. They use a leather quiver, and a shield of leopard's skin, ornamented with feathers and with small mirrors in the center. They are cowardly, and only attack unawares; crafty and treacherous, and scalp their victims. They make use of smoke for telegraphic signals. They are fond of hunting deer and wild boars, "ciballos," or Mexican bulls, black bears, wild

goats, and Rocky Mountain sheep. Their dress consists of a strip of linen passing between their thighs, and fastened at the waist, and leggings of deerskin with fringes, ornamented with beads, and garnished with leather strings, and wear pendants and ear-rings, and in their hair they fasten a long false braid, adorned with trinkets, shells, or silver buckles. The women, who are as active as the men in their habits, use very short garments of deer-skin or kid, which they call "tlacalee," with fringes of leather strings, on the edges of which are hung casebels, tassels, and red beads. They wear, also, a kind of jacket called "bietle," made of the entire deer-skin, open in front, ornamented in the same manner. They wear moccasins of deer-skin, the same as the men, which are called "teguas," and are fastened to the leggings. They are all of swarthy complexion, well proportioned, wear long hair, and no beard. Both the men and women have very small feet. The women decorate themselves with ear-rings of shells, or small green and white stones, resembling crystal; and in some instances the men are decorated in like manner. Their huts are simply poles covered with grass or skins, and a small door, admitting a grown person. If the place is wooded, they encamp at the foot of a tree, and cover the branches with grass to protect them from the rain; but generally they live without any protection whatever. Their atrocities are well known, and they have long been a terror to the Sonorians; but the dispersion of Victorio's band subdued them, with the exception of small roving bands, that do not hesitate to attack even the stages, as they did but a short time since, near Mesilla, in New Mexico. Comparative peace may be said to exist, though settlers may do well to keep on the lookout, and travel well armed.

DISCOVERY OF GOLD.

In 1799, the first discovery of gold in the western part of the state was made at San Ildefonso de la Cieneguilla, about forty miles south or south-east of Altar, of which many incorrect accounts have been published. This discovery was accidental, and occurred as follows :

“A company of soldiers from Altar, on their way to chastise the Ceris, having gone in a south-east direction, encamped in that neighborhood. One of their number, who was strolling about one hundred yards from the camp, observed that the bed of a small ditch formed by the rain was of a yellowish color, and on further examination, he collected a number of pieces of gold from the size of a lentil to that of a bean. He reported this to the commander of the detachment, who immediately ordered a careful examination of the surrounding country, the result being the discovery of gold in all parts in greater or less quantities. The gold lay upon the surface, scattered like grains of corn. The gambucinos followed its direction to the west to the distance of six or nine miles, where they encountered a natural phenomenon. The beds of all the ravines within a circumference of more than 12 miles was covered with particles of gold, hundreds of these weighing from one to 27 marcs, and presenting the appearance of having passed through a furnace.”—*Velasco*.

After the surface gold was exhausted, shafts were sunk and tunnels run through a vein of calcareous stone in some places, and in others through a stratum of red stone, both of which contained gold, and from which large quantities were extracted. The mine was actively worked until 1803, when a second mine was discovered, called San Francisco, 21 miles east of Cieneguilla, which is about 40 miles south-east of Altar. “This mine proved extremely rich, the gold being scattered about on the surface in great abundance, especially in the ravines. In the ravine called San Miguelena, the gold was so abundant that three, four, and even five

marcs were often collected in five minutes ; the grains being the size of a bean. Large lumps were occasionally discovered. One found by a Yaqui weighed 100 ounces, and another weighed 28 marcs. Quitovac, San Antonio, Sonoita, El Zóñe, La Basura, San Perfecto, Las Palomas, El Alamo, El Muerto, and Vado Seco, are gold mines discovered from 1834 to 1844 in the vicinity of Altar."

Mines of Sonora.

The mines of Sonora have been worked from time immemorial. The immense number of old mines that have a history clouded with early traditions prove the ancient character of the mines of Sonora. Some have been known to reach back one hundred years, and others have no data to determine the first period in their history. The number of abandoned mines are considerable, some of which were unquestionably exhausted, while others were abandoned on account of the ignorance of the miners on reaching ores that were refractory or hard to work. Right here it might be well to caution American capitalists against buying holes in the ground, solely because, at one period in their history, they had yielded millions.

Most of the abandoned mines, or quite a large number of them, and of the richest, have been ruined by the class of miners of Mexico called "gambucinos," a poor class who had no capital, and were in search of "bonanzas," or rich spots, working these solely, and filling the drifts and shafts behind them with rejected ores and rubbish, so that, when they finished a mine it was almost entirely ruined. In some instances, they have extracted the pillars of old mines of great value, and the walls have fallen in, thus doing an incalculable injury to the mines of the state. There is an old Spanish proverb that tersely states: "It takes another mine to work a mine."

This is undoubtedly true of every mine abandoned by these miners. We use strong language on account of the destruction following in the wake of the "gambucinos." The warning of Mr. Mowry to capitalists in his valuable work on Arizona and Sonora, we herewith quote, and leave its lesson with our readers. He says: "As it is desirable that, in the investment of foreign capital there should be no error committed at the outset, than which nothing would retard the progress of this new mining field more; all persons new to the country had better leave abandoned mines

alone, unless directed to them by persons long resident in the country, whose character and veracity are undoubted, and who, after the investigation of all the facts, current accounts, and traditions, have full confidence in some abandoned mine or other. There are, undoubtedly, many abandoned mines that are well worthy of attention and outlay of capital, but strangers are not likely to know at once which of the many deserted mines it will be prudent to meddle with. Under the present state of things, the safest investments for new comers will be *those mines that have bona fide owners, for, as long as a mine can be worked according to the custom of the country, it is hardly ever abandoned altogether. The owners are fully alive to the value of their possessions, and as they are already in a more or less independent position, and always in expectation of a sudden fortune, they are not anxious to sell unless induced by a fair offer. It is not advisable to enter into any arrangement with Mexican miners to furnish capital to open up a mine, but it is better to buy the whole at once.*"

The Mexican people are shrewd and full of grandiose language, extravagant in speech, and due caution in taking their description of properties, with some allowance when they are anxious to sell, is of the first importance. It may be well to remember that where an anxiety to sell is apparent, that the purchaser will do well to make haste slowly, and look further for investment. The properties that are being worked, and where a fair examination can be made by reliable mining engineers, are the ones to buy. These are mostly not for sale, but they may be purchased on a liberal offer. Another way to obtain properties of value, is to prospect for new mines, and when a discovery is made, by "denouncement" a title may be obtained under the laws of Mexico that is perfectly valid; and indeed, this is one of the safest means to obtain valuable mines; for the whole state is rich in veins of gold and silver. In the appendix may be found an abstract of the mining laws of Mexico, with directions as to the obtaining of properties in the republic.

As an instance of the unreliability to be placed on representations of the riches of mines that are for sale in Mexico, we give the following data: A company of gentlemen of this city were induced to open up an abandoned mine, called Santa Gertrudis, near Altar, which was represented by the parties interested, to be very rich. The vein first discovered was narrow, but was followed down on the assurance that it would become broader and richer. Extensive plans were entered upon; a stamp mill and engines purchased, ready to

be shipped as soon as the mine was developed sufficiently to warrant the erection of the works. The vein was followed for nearly 200 feet, and some \$30,000 were expended. The result was unsatisfactory and the mine was abandoned; the representations being entirely erroneous, to say the least, as far as the experiment progressed. Thus, it is easily seen that experiments in mines in Sonora are as unsatisfactory as in California; and it is well to be cautioned in advance in regard to abandoned mines and properties that are found upon the market. We could point out other instances with similar results. *The paying mines, as a rule, are not for sale*, though there are some exceptions, and no greater mistake can be made than to expect a rich mine in as old a mining state as Sonora, to be bought for a mere nominal sum. There are exceptions, but they are rare; a fair offer has to be made to purchase a valuable mine.

Mining Districts of the State of Sonora, and Location and Description of Mines.

The Alamos mining district is situated some 240 miles south-east from the port of Guaymas, on the direct road from that point to El Fuerte in Sinaloa, and on the road also from Arispe on the north to the same place, and from thence to Culiacan and Cosala and Mazatlan. This district is particularly rich in silver leads. The principal mines are as follows: The most ancient and richest mine is the Quintera, several millions having been taken from it since its discovery, over 100 years ago. It is of immense depth, and has been abandoned, and is worked occasionally by gambucinos, and is mostly exhausted. There are many old mines of whose origin we can obtain no data, their origin being known only by tradition. Among the Promontorio mines in the small Real of Promontorio, five miles north of Alamos, may be mentioned the Nuestra Señora de Vabranora, which was owned and worked by the family of Almados for the last century. Don José M. Almado reached a deposit of black ores at a depth of 600 feet with surprising results. The present owners are an English company, who purchased the mine from Mr. Robinson of Guaymas. The ores are reduced at the works situated at Las Mercedes, about two miles east of Alamos. The Promontorio mines contain the best ores in the district. The Promontorio mine, from which the mines were named, especially has produced exceedingly rich and abundant ores. The Tirite mine, to the south of

and adjoining the Promontorio, is said to be still richer, but its vein is not so wide. It was formerly owned by James Brady of Guaymas, who reopened it by running a tunnel into the heart of the vein. The pillars in the old shaft and drifts were taken out some years ago by Pascual Gomez, and two of them yielded \$80,000. The Dios Padre mine, adjoining the Promontorio on the north, was, prior to 1860, owned and worked by Fernando Aduña, son-in-law of José de Almadó. In August, 1860, Mr. Andrew J. Wiley from California purchased the mine, and associated himself with Messrs. W. W. Light, D. Maddox, U. F. Moulton, Skinke, Backus, Beard, Sanborn, Oatman, Robinson, and L. A. Garnet. The mine was reopened by a shaft and yielded very profitably.

The Quintera and Libertad mines are located north of the Dios Padre. The Pulpito, on the same lead, was discovered by a Mexican, who worked it secretly. In January, 1861, Mr. Benjamin Rountree purchased the rights of both parties and associated with himself Messrs. W. W. Light, Johnson, Price, Thos. Finley, Robert S. Stillwell, J. R. Hardenburg, and others, and they proceeded to open up the mine, but found it unprofitable and abandoned it. The Nacharama mine is situated nine miles from Alamos, and is one of the most celebrated in the district, but it was abandoned on account of the influx of water. In 1860 the mine was purchased by Messrs. W. T. Robinson, J. G. Baldwin, Thomas H. Williams, Wm. S. Long, Henry Fouche, and others. The mine had the reputation of being rich at the time of its purchase. The Vista Nacacharama mine was purchased by Messrs. Robinson, Ira Oatman, Goggins, Bowman and White-side, and was called the Sacramento Company's mine. The Mina Grande, Europa, Iglesia, and Palomos are well spoken of by tradition. The first two were denounced by Michael Gray in January, 1860, and afterwards sold to John Heard. The Pietras Verdes, 15 miles north of Alamos, and Narvayez, in the Promontorio, are filled with water.

There are three large haciendas for the reduction of metals in the city of Alamos, called La Aurora, La Ubalama, and Las Cabras.

The district or Real of Minas Nuevas is located about two leagues west of Alamos, and contains many rich mines, among them, San José Ubalama, which is situated six miles from Alamos, and was owned by W. J. Hill and E. B. Johnson, who erected machinery at the mine to work it. Tradition spoke of it as exceedingly rich. The Descubri-

dora, Rosario de Talpa, Sambono, and others, are located in this district.

The Rosario de Talpa and the Sambono were once successfully worked by Mr. Robinson of Guaymas, and T. Robinson Bours, formerly of Stockton, but who now resides at Alamos. The San José mine is situated six miles from Alamos, in this district, and was owned by W. J. Hill and E. B. Johnson, in 1861, who placed machinery at the mine to develop its riches, which tradition declared to be fabulous. There are many other mines in the vicinity, as we have only mentioned the principal ones, and the district is unquestionably one of the richest in Sonora.

The mine called Balvaneda, situated in Promontorio, formerly belonged to José Maria Almado. It was formerly rich, and yielded handsomely up to 1861, though the water flowing into it caused such trouble and expense that it was afterward abandoned. La Europita, in the Promontorio, was worked by Don Manuel Salido up to 1861, with good results.

Lead is found in the ores of the Promontorio mines, which may be used for smelting, although most of the ore is reduced by mills. La Europita was once one of the richest mines of the district, and with Quintera, produced an immense amount of silver. These two mines gave to Alamos its greatest celebrity. The former was worked up to 1861.

Although Aduaña is generally included in the district of Alamos, yet it possesses a group of mines that are distinguished from the Promontorio mines. The Aduaña is situated about three miles west of Alamos. In this district, which, with that of the Promontorio, comprises an area of eight leagues, with the face of a small mountain range included on the south, are located many old and new mines over the whole area, which Velasco pronounces, that "without exaggeration, there is not a hand's breadth of the soil which does not contain some vein of the precious metal." La Coterá and Santo Domingo, and Nacacharama and La Libertad in the Aduaña, were all worked up to 1861. Calesa and Los Cangrejos are full of water.

There are five haciendas in Aduaña for the reduction of ore—one in Talajiossa called Zarragoitas, La Espinosa, and the old hacienda of Promontorio; also, two in Minas Nuevas; making eleven in all.

The district of Alamos contributes very largely to the export of silver from Sonora, part of which is exported from the port of Santa Cruz de Mayo, south of Alamos, on the

coast, distant about 100 miles, which is said to be one of the favorite points for smuggling bullion out of the state, while the larger proportion is carried to Guaymas.

San Ildefonso de la Cieneguilla.

This district is located in the western part of Sonora and north-west of Hermosillo about 100 miles, and south-east of Altar the same distance. Scarcely any region equals this in its number of veins of gold and silver. Its first mine, called Descubridora, was discovered four years after the first placers, to which we have referred under the heading of "The Discovery of Gold." This mine yielded abundant quantities of silver ores, the yield of the poorest being five to seven and the best 12 to 15 marcs to the "bulto" of three cargass (900 lbs.). Its owner received from it, in less than four years, \$2,000,000. Fifty small establishments for crushing ores were erected and in constant operation, from which large profits were realized. The vein was crossed, after the mine had been worked for five years, by a species of hard rock, called "caballo," which was again repeated. This discouraged its owner, and the pillars were removed, which yielded \$500,000, and supports of strong timber exchanged for them; but the gambucinos soon left the mine in ruins. Many other mines were discovered in the neighborhood, but none so rich or abundant in ores. Only one exceeded it in the quantity of its ores, viz: the Cerro Colorado, in the Cieneguilla district, six leagues to the east of Cieneguilla, on the right of the road to the placers of San Francisco.

From the appendix of the work entitled "Sonora," a translation of Francisco Velasco's great work, by Mr. Wm. F. Nye, published in 1861, we quote the following interesting fact in relation to the Cerro Colorado mine. He says: "The Cerro Colorado mine is situated some eight or nine leagues from the city of Alamos, on the bank of the Mayo River, and derives its name from the reddish color of the mountain in which it is located. It was formerly owned by Castro and Don Manuel Salida, and afterwards by Dr. W. J. Hill, of Alamos, who sold one-half his interest some few months since for \$12,000. Messrs. J. S. Garwood, E. D. Wheeler, Michael Gray, and others of San Francisco, were the fortunate purchasers. The last owner of this mine, Don Manuel Salida, took from it more than a million of dollars, and, at the time of his death, gave orders to blow the mine up, which was accordingly carried into effect by his peons.

The writer visited the mine in company with Dr. Hill; but, on account of its dilapidated condition, could not explore it. At a depth of 70 feet is a chamber 20 feet in diameter and 25 feet high, the walls of which, impregnated with virgin silver, glittered like diamonds by the light of a solitary candle. In working the mines of this district, it is not unusual to discover spots of exceeding richness, called by Mexicans 'bonanzas,' and from one of these, from two to three hundred thousand dollars are frequently extracted."

Gold Mining Districts.

The district of San Francisco is located seven leagues to the east of Ildefonso de la Cieneguilla, and was discovered Oct. 4th, 1803, by Teodoro Salazar, who was searching for a mine of which he had received notice. This mine proved extremely rich, the gold being scattered about on the surface in great abundance, especially in the ravines. The ravine called San Miguelena was the richest spot, and the grains were coarse, being about the size of a bean. Large lumps were occasionally found, one of which weighed 100 ounces, and another 28 mares. In portions of this mineral region the gold was mixed with white quartz, which led to a ledge of very rich gold-bearing quartz. Here a mine was opened by Teodoro Salazar, and he occasionally struck extensive pockets that were very rich. The mine was eventually abandoned, and another found one league distant from San Francisco, not so rich as the former, but yielding very fine gold, of 22 and 23 carats fine. In the Sierra to the south, veins were found near the creek of San Blas, a small town near the northern border of Sinaloa. The water in the creek having failed, this mine was abandoned. The annual yield, on an average, of the mine of San Francisco, Velasco puts at from \$1,000,000 to \$5,000,000. Quitovac, San Antonio, Sonoita, El Zóñe, La Basura, San Perfecto, Las Palomas, El Alamo, El Muerto, and Vado Seco, were the gold mines discovered from 1833 to 1844. Since that time, many other mines have been found, bearing both gold and silver. The great drawback to the mines of San Francisco, which are so rich in gold, is the scarcity of water, which has been brought from the river Arituava, 21 miles distant, and commanded fabulous prices. If the waters of the river were conducted to the placers, or artesian wells sunk and reservoirs formed, the mines would yield immensely.

The district of Mulatos is located to the north-east of

Alamos, and nearly due west of Jesús Maria in Chihuahua, upon the slope of the Sierra Madre towards the gulf, and is called the Mineral of San José de Mulatos, which was discovered in 1806. Two gold mines were here found, from which were taken several thousand marcs of gold, 24 carats fine. The region is located near the eastern border of the state, in the pass of Mulatos, about 70 leagues, or 210 miles, from Hermosillo. It is said that several millions were extracted from these mines. The gold was first found in a small stream which descends to the river below. Adjoining this ravine and near the placers, three elevated crests were discovered, one of them over one hundred varas in height, which were intersected in all directions by small threads or veins of gold-bearing white earth, or rotten quartz, that were so rich that the ore of inferior quality was sold at \$12 and \$15 per arroba (25 pounds), while the richest sold for \$200. These crests have been extensively worked. The gold is nearly pure, the lowest ore being 23 quilates, while it sometimes reached $3\frac{1}{2}$ grains. A number of Indians at first worked the vein by being suspended by ropes from the side of the rocks from the crests above and picking out the earth with wooden sticks and knives. The mines were abandoned some years ago, but have since been denounced by an American company, who are working them so profitably, we understand, that they have lately refused \$1,000,000 for them. The ores are reduced by an extensive stamp-mill, located on the Mulatos River, below the mine. This river has sometimes been called the Aribechi and Papigochi.

The district of San Xavier is distant from the port of Guaymas in a north-east direction, and about the same distance from Hermosillo, approachable from both points by an excellent wagon road. This is one of the oldest and richest mineral districts of the state. There are many mines situated within a radius of three miles—namely, Los Bronces, owned by Don Alsua of Guaymas; Las Cruzecitas, Las Aguas, Señor, Las Cumbres, La División, La Nahuilla, La Barranca, Las Animas, La Sierra, and many others. Among the most important, Los Bronces may be mentioned, which is worked by Don Matias Alsua of Guaymas, who has erected extensive reduction works, with stamps, barrels, furnaces, etc. His ores are worked by the German or Freyburg process, and the mine has yielded about \$1,000 per day. Near this mine is located the La Barranca, in which a vein of coal was found nine feet in thickness. It is supposed to be anthracite, but this is denied by some experts, who

claim it is more of the nature of bituminous coal. We examined a piece of this same coal, and it appeared to us to be similar to the bituminous coal of Pennsylvania.

About 200 yards above the Los Bronces mine is situated the Las Cruzecitas, which is owned by the Las Cruzecitas Mining Company. It has been extensively developed, and ten tons have been raised daily; and when further developed, will yield much greater quantities. The vein, which is particularly well defined, increases in width and richness as it descends; and at a depth of 145 feet, the vein was nine feet wide. The ore of the pillars is very rich; while that from the mine averaged over \$150 per ton, all through. The "Petanque" has rich sulphurets of silver, which are extracted from the lower excavations, and assay over \$3,000 per ton. The Company have erected reduction works at the mines. La Naguilla is situated on the highest hill in this region, in sight of the main road; its ores were formerly abundant, and their "ley" in silver, ten marcs to the carga. It however filled with water, and although an attempt was made to work it out, it was abandoned upon reaching a "caballo." Las Animas is also one of the old mines, and is now choked with earth; the "ley" of its ores was four or five marcs to four arrobas. Its vein was narrow, but contained an abundance of ferruginous ore, which, though rejected by the miners in former times, yield three to four marcs of silver to the carga. The amalgamating ores are also abundant, and of about the same "ley." In Los Afurnos, the vein is half a vara in breadth, and was profitably worked by Castillo. The mines of La Grande were equally rich with the others. The rest of the ores of San Xavier are smelting ores, or reducible by fire, with some exceptions. Enormous quantities of silver were remitted to the City of Mexico from this district, and prove it to have been very rich.

"The mine of Zubiato is situated eleven leagues (33 miles) south-east of Hermosillo. It was discovered in the year 1813. Its first owners were not able to pay their expenses, and sold out to two persons called Monge and Muñoz, who derived a handsome profit from a mine hitherto worthless. Muñoz, having acquired sufficient wealth, sold his interest to Francisco Montevideo, who continued the operation, in company with Monge, until the death of the latter, who left a large fortune. Montevideo then became sole owner of the mine," and worked it up to the time of his death, leaving it to his son, M. Montevideo, ex-Governor

of Sonora, who is now in this city. "Its average ley did not exceed five to six marcs to three cargass of 300 lbs. each, or about from \$36 to \$45 per ton; but occasionally ores are found which yield two to three marcs (\$3.20 to each marc) per arroba of 25 lbs. each, or from \$480 to \$720 per ton. Water flows into it, and for some time the sole profits of the owner were derived from furnishing supplies to his workmen." Governor Montevideo informs us, that since the publication of Francisco Velasco's work on Sonora, from which we quote the foregoing, that he has found the mine to become very profitable, and it now assays from \$80 up to \$1,000 per ton, having reached ores on a lower level that are very rich. This mine is for sale, and can be purchased of Governor Montevideo. He also informs us that \$12,000,000 have been extracted from the mine since its discovery, or in a little over 67 years.

San Antonio de la Huerta.

This district is located about 15 miles from San Xavier, and contains La Minas Prietas, Musidora, and other valuable mines, both of gold and silver. The Minas Prietas was purchased of Mr. R. D. Johnson, of Guaymas, by the Janin Bros., of this city, and sold to a company in New York. The point of location on the maps of this mine is erroneous, and should be at the point marked Haygame, about 35 miles south-east of Hermosillo. A new 40-stamp mill is being erected for this mine. There was an old 10-stamp mill on it, which, with *arastras*, were used to reduce the ore.

Cieneguita District.

The following official report on the Mineral de la Cieneguita, of Robert L. D'Aumaille, official assayer of Sonora, is copied from the valuable work of Mr. Mowry, "on Sonora and Arizona"; our object being to give all the information available on the mines of Sonora, and also within the limits of the states of Chihuahua, Durango, and Sinaloa. On the mines of this district, his report reads as follows: "About 300 yards from the hacienda is the mine La Carjona, of trifling depth. The metal is plumbiferous, vein one foot in width, and assays \$16 to the 100 pounds. The water from the rivulet adjoining, has filled the shaft, which is not deep. Two miles distant in same direction, lies the hill that contains the veins of La Chipiona, La Colorada, La Plomosa,

and another fallen in, whose very name has perished. The veins have been opened in many parts by the Spaniards, who content themselves almost invariably with sinking shafts for the extraction of the superior decomposed ores, abandoning the mine on reaching sulphurets, from ignorance of the process for the extraction of silver. In these sulphurets, and below the old galleries are situated the present workings. La Colorada, on the north side of the spur, is a portion of the Veta Madre (or main vein.) The workings are dry and firm; the galleries 50 feet in length and 45 in width. Another shaft, 22 feet, is opened 80 feet farther down the mountain, where the ores are uncovered to the same width. The vein in the lower places is about 18 feet in width, in parts 30; running north and north-west, with an inclination to the south-east of about 15 degrees, an excellent course and dip in Mexican mines. The assay was \$172 silver, per ton, and traces of gold. La Chipiona is also upon the Veta Madre; vein same direction and dip as La Colorada; shafts, two, 30 feet apart; depth 30 feet, and partly full of water. The vein is 20 to 36 inches; same depth, and quality of metal uniform. The ores are more difficult of reduction, being bisulphurets of iron, with a compound sulphuret of silver, lead, iron, and copper; by the German process, assays 160 ounces per ton. The ores of La Colorada by same process, gave 212 to 320 ounces. There is not half the superficial excavations of the ancient mines, which have been cleaned out from this vein, and the falling in of the *labores*. The vein can be traced 250 yards, across the crest of the hill, up to the mouth of the La Colorada. Above the main vein is a cross-vein of 4 to 6 inches, cutting it nearly at right angles. The ore is said to yield 318 ounces of silver per ton. Nine hundred feet distant, in a straight line, in a spur of the same cerro, is the adit of La Plomosa; the upper workings being badly planned, have fallen in from the pressure of rubbish in the old drifts, and the miners have driven a level in the solid rock 150 feet farther down. The ores are argenteiferous galenas, with a matrix of stratified 'calishe,' and are said to yield 18 per cent. of lead, and 96 ounces silver, per ton, up to 190 ounces. Both this vein and La Chipiona run across the valley and strike the opposite mountain. Old mining shafts are seen all the way across at different points. These mines can all be drained by a tunnel, as the Chipiona debouches upon an abrupt descent, by many hundred feet. The walls are firm and vein regular, presenting every indication of permanence. A quarter of a mile south-

west of the Yerba Buena, are the mines of Los Tajos. The hill-side is covered with the buried workings of the ancients, and the superior position of the vein is in a very precarious condition. The vein is something like one-half a yard in width, with a heterogeneous medley of ores. It runs completely through the mountain, as very considerable works are visible on the opposite side; but whether 'en metales,' or not is unknown.

"The ores are said to yield 60 ounces per ton, but they are loaded with titaniferous and zinciferous metals. La Descomulgada is situated about a league west of south-west of the Yerba Buena. Its matrix is a very hard, silicious rock, which crumbles with great rapidity when exposed to air and moisture. The vein is said to be wide, and the superficial ores easily worked, costing \$1.00 per 300 lbs., and to be easy of reduction.

"La Yerba Buena is a modern mine, said to have been very rich. The mouths have fallen in a few hundred yards from the Yerba Buena, on the road to the Descomulgada. Nothing more is known concerning it.

"Las Ostimuris, on the road to Yerba Buena, about half way from the Cieneguita, has two open mouths, and is full of water, the drifts running under the brook. Mr. Monge says it was abandoned on the outbreak of the Opatas, and as the shafts were shallow, the vein wide, and the ores yielding 450 oz. per ton, he entered into a contract with a skillful miner and put up whims and machinery for drainage. His partner died just as they were approaching completion; the Apaches drove off their animals; and, being ignorant of mining, he abandoned the mine.

"La Prieta is on the rancho of Matarchi, about six miles east of Cieneguita. The vein is from four to six feet wide. The opening is merely a trial pit. The ores of the outcrop are a melange of different sulphurets, heavily charged with copper.

"El Potrero, 24 miles distant, is said to be an immense 'clavo' of volcanic origin, and unknown extent, at the intersection of two veins. The ore is without alloy of silver, but contains much oxide of lead and spar. It forms an excellent flux for the ores of La Prieta, and Los Tajos. The cost of carriage is the only expense.

"La Viruela, east half a mile from the site of La Armargosa, is a lofty hill, from which large quantities of gold have been extracted, but the whole hill has fallen in.

"La Armagosa, and the rivulet which runs beneath El Re-

alito, are constantly searched for gold. The water of the creek is not sufficiently abundant for machinery, and an examination was made of La Armagosa, one-quarter mile east, where a stream was found that is permanent and may be conducted by a tunnel. It furnishes a considerable volume of water, with a natural fall of 100 feet within a space of 100 yards in its own valley.

"Yerba Buena is three and a half miles south-east from the real, four and a half from La Chipiona, and four from Los Tajos. This district is located near Sahuaripa, about 50 miles south-east. The river is the Arroyo de los Ostimuris, which is permanent ten months, and sufficient to turn the wheels during the remainder of the year. Wood is abundant, and consists of oak, pine, juniper and ash. Pasturage, everywhere. Animals are said to fatten all the year round. Salt can be purchased at from \$8 to \$10 per carga of 300 lbs.; wheat, \$6 per fanega. Freight from Guaymas, \$80 to \$90 per ton; from Sahuaripa, \$3 per carga. Cattle are purchased from \$10 to \$15; hides, \$1.00 each; mules and horses, dear; powder of the country, \$7.00 per 25 lbs; flour, \$7 per arroba." The ores are hard and require blasting, but, as seen before, are very rich.

"The Real of the Cieneguita embraces the mines known as La Chipiona, La Colorada, La Cajona, La Prieta, and the vein of copper in Matarchi, La Descomulgada and Los Tajos, La Viruela, and El Realito, San Rafael, Ostimuris, Yerba Buena, and El Potrero. All of these mines are within a radius of three miles.

"The principal vein appears to be that of La Chipiona. The origin of the real is unknown. The general belief is that it is the long-lost Real of Tayopa, famous in the early Spanish annals. The ores of the Chipiona, Colorada, and others, are refractory, being mostly hard ores and sulphurets. The titles to the mines, except those of El Potrero or La Prieta, and the copper vein in Matarchi, are on the ranchos of La Yglesia, a fine grazing estate of eighteen square miles in extent, belonging to and in the occupancy of Don José Yrenco Monge. The title is said to be perfect and undisputed, a Spanish grant of Carlos III. It is wooded and watered, and contains sufficient arable land. The rancho of Matarchi, which bounds it on the westward, is a beautiful pine forest, with some excellent cultivated land, containing nine square miles, well watered, and is likewise a Spanish grant of the last century. It contains the veins of La Prieta and the outcrop of copper.

"The mines Los Tajos, La Descomulgada, and El Realito, with four pertenencias, El Potrero, and La Viruella, are each the extent of La Chipiona's and La Colorada's possession, which was given by the Prefect of Sahuaripa on the 13th of September; is 1,800 feet in length; width, 600 feet on La Plomosa, and 1,350 feet in width, including all the present workings in the three mines. The sites called El Potrero, La Armagosa, La Cieneguita, and Yerba Buena, were denounced as "Haciendas de Benefico," or position for reduction works. The Real of Cieneguita is situated in a pretty little dell, embosomed among lofty mountains, almost at the foot of the Sierra de San Ignacio, and partly embraced by the unbroken ranges of the great Sierra Madre. These mines are now worked by a 30-stamp mill, and are producing immense profits.

"It is distant, perhaps, by the road, 42 miles south-east of Sahuaripa, nine miles south-east of Tarachi, and 72 miles west of Mulatos. The real contains about 20 acres of cultivated ground, and is supplied by a spring and perpetual brook, which traverses its center. The climate is mild. In winter, the snow falls occasionally two feet, and ice forms two inches thick. The road leads from Sahuaripa through mountain passes. From Aribechi to the real it is all mountain, except the plain of Las Cazadores, in the rancho Aoyua Blanca, and the valley of the Rio de Ostimuris, from which the road runs from Santa Fé to Tarachi. A considerable portion of the real is covered by the foundations of houses and ruins of smelting works, or immense piles of scorïæ and rubbish, proving incontestably to the practical eye the vast extent of the ancient mining operations." And another proof, we might add, of the former richness of these mines. We give this extended description, in order to show how an abandoned mine looks to the traveler as well as the mining engineers, although these same mines have since been reopened and worked by a 30-stamp mill, as before stated.

We are indebted to Mr. John A. Robinson, of this city, for the following :

"Some fifteen miles north-east from the famous gold mine of Mulatos, lies a cluster of mines known as 'Mineral de la Cieneguita.' There are some fifteen mines in all ; the principal of them are the Chipiona, the Colorada, and the Plomosa ; the two first being very rich in silver and gold, and the last in lead and silver. The country surrounding offers every facility for mining and reduction works. An abundance of water, heavy forests of pine, hemlock, various species

of oak, juniper, etc. Building-stone and fire-clay in the immediate vicinity, with pasturage for the animals. The mines are at present worked on a small scale by some German gentlemen; but parties are now examining them with the view of establishing reduction works on an extensive scale by the lixiviation process. These mines are extremely rich in 'ley,' and abundant in ores. Some sixty miles to the east of the above are situated those extremely rich copper mines called 'Huacarbo,' in the Barranca de Tarrique. Here also the facilities for working are great. The river Yaqui runs immediately at the foot of these immense lodes; and the country is thickly covered by heavy timber. The Yaqui River, in places, runs over the copper-vein, leaving the ores in sight for a long distance. Both of the foregoing mining districts were fully explored by Robert L. D'Aumaille, a most famous mining expert, chemist and amalgamist, sent there by Don Juan A. Robinson, formerly United States Consul for Guaymas, Sonora, and at present residing in this city. D'Aumaille reports that the copper vein is intersected in different places, by narrow gold veins of a very rich 'ley.'"

The district of Babicanora was discovered at the end of the last century, eight leagues south-east of Arispe and four from Sonoquipe, in the Sierra, running north and south. It was, at one time, very rich, and had a hacienda for the reduction of ores below Sonoquipe, one mile from the bank of the creek. It was abandoned by its owners some years ago, until Mr. Hunter, an American, lately obtained possession of two of the mines. One is called Mendoza, which has a vein three feet wide, and assays \$80 per ton in silver. The other is Santa Ana, and has a vein one vara in width, (33 inches) with an assay similar to the other. Mr. Hunter has erected a ten-stamp mill, and is now working the mines profitably.

The hacienda of Gov. Pesquiera, called Las Delicias, is situated about 20 miles south-west from Arispe, and consists of about 30,000 acres of good land, about one-fifth of which is first-class agricultural land, and being in the neighborhood or west of the Sonora River, the soil is somewhat of the same nature, and produces wheat, corn and other cereals, as other lands on the Sonora River. The balance is good grazing land. The Santa Elena mine is located about four and a half miles from the hacienda, on a ridge of mountains, and is owned by Gov. Pesquiera, who erected a ten-stamp mill at the hacienda.

It is not in working order, and is fast going to pieces. The mine has been mostly worked by *arastras*, and produced, in one year, \$200,000, but has never been properly worked. The best ore assays \$5 per ounce bullion, gold and silver. The shaft is about 200 feet in depth, with a varying vein, sometimes reaching 15 feet in width. The mine is dry, with walls of porphyry and quartzite.

The Curcurpe district also contains many mines, among which may be mentioned the ancient mine of El Tajo, which is now full of water and in a ruinous condition, having been destroyed by the *gambucinos*.

The Santa Teresa de Jesus mining district is located 69 miles south of the boundary line of the United States, on the northern frontier of the State of Sonora, and 36 miles from Magdalena; the latter being only about 140 miles from Tucson.

We copy from a report of Mr. L. Jannin on the mines of this district, which has just been published, the following: "Leaving Cucurpe, and passing by the cultivated fields of its inhabitants, we find the road to the mines leading up the San Miguel River, sometimes emerging into an open plain. After following the course of this river some twelve miles, and passing El Pintor and the deserted Pueblo de Dolores, the road leads us over table-lands and meadows, the former adorned with oak and ash trees, the latter covered with waving grass, until we reach a broad belt of thickly wooded land, where the San Miguel first makes its appearance in the dry season. From this point the river always contains running water. In the rainy season it rushes violently along, sometimes overflowing its banks, but in the dry season it floats along tamely, scarcely covering its bed. All the land between Cucurpe and this point is of the richest description. It is unsurpassed in fertility by any portion of Sonora, and grain of all kinds can be raised without the slightest trouble.

In former times, the whole valley was populated, and the number of cultivated fields and the numerous herds of grazing cattle proclaimed the wealth of the inhabitants. But the continued incursions of the Apaches since 1832, by driving off the unresisting inhabitants and gathering the harvests they had planted, have depopulated and ruined the country. Deserted ranches are met along the road. No one lives here. No one dares to plant grain, and, as it is here, so it is also throughout the northern part of the State. Leaving the belt of wooded land that I have mentioned, the

road still takes us over meadows and table lands, up the valley of the San Miguel and toward its source, the Cañon de Santa Teresa, a distance of 15 miles. Here, low ranges of hills, isolated peaks, and broken country, becoming more and more frequent, herald our approach to a mountain range, and soon we are in the cañon, with steep hills on each side.

The range of mountains in the foot-hills, in which are the mines of Santa Teresa, is known by the name of Sierra Azul, and its culminating peak is the Cerro Azul, which towers high above all the range, forming a most prominent object for a distance of over forty miles. The general course of the range is north and south, but spurs of the Cerro extend in all directions. The country is mountainous in the extreme. There are no table-lands, no valleys, and no open space of any extent, nor are the ranges of foot-hills continuous, but are broken up by side ravines and cañons, down which, in rainy seasons, the water finds its way to the various arroyos. These arroyos form the circuitous roads by which one point is reached from another. The position of the Mineral de Santa Teresa is correctly indicated by Colonel de Fleury's late map of Sonora. From it can be seen the relative position of the Mineral to the neighboring pueblos, owing to the mountains around it. The only broad road leading to the mines is the one I have described. All others are, and can only be, foot-trails. The mines are upon three distinct veins, known as the Trinidad, San Antonio, and the Santa Biviana. The openings on the Trinidad and San Antonio are in the Real de Santa Teresa, while those on the Santa Biviana vein are in a neighboring real of the same name.

The Real de Santa Teresa is approached by a cañon of that name, and is situated some three miles from its outlet. The bed of this cañon is a dry arroyo, and its sides are formed by a range of foot-hills rising up several hundred feet, and inclined towards the bed at an angle varying from 50 to 70 degrees. The arroyo varies in width from 50 to 300 yards, and forms the only road to the mines. In the rainy season, the water flowing down from the various ravines and from the Salto, (the source of the San Miguel) fills the arroyo and renders freighting in wagons difficult, but does not impede transit by mules and pack-trains. At the time of my visit it was perfectly dry, and generally remains so during nine months of the year.

The Cañon de Santa Teresa has a generally north-easterly

direction, although subject to many turns. In the neighborhood of the mines, its direction is as indicated, and the vein pursues a nearly parallel course. The mountain mass of this Mineral—in fact, the whole range—is a hard, dark-blue limestone, distinctly stratified, and dipping to the east at an angle of 50 degrees. Its strike is nearly north and south. The course of the veins is contrary to the stratification of the limestone, which forms its walls; and they have all the appearance of being true fissure veins. The walls are generally firm and enduring.

The Trinidad vein crops out at various places on the northerly slope of the cañon. Its general direction is north-east by south-west; but it changes its course with the slope of the hills, and at places it is heaved by faults and cross-veins. The outcroppings can be traced at various heights above the head of the cañon, until it reaches the opening called El Arroyo. Here the vein leaves the northerly slope of the cañon, crossing over the arroyo in a diagonal direction, and finally emerges on the opposite slope, still preserving the same general direction. The San Antonio vein, on the other hand, is entirely on the southerly slope of the cañon. Its general direction is north-east by north, but it also changes its course with the slopes of the hills. These two veins converge toward one another; but although they have been followed for many a weary mile, their point of junction has not been discovered. The general appearance of the outcropping is the same in the two veins, with some slight local differences. It is a hard, compact quartz, sometimes thickly impregnated with peroxyd of manganese, and at others, merely colored by its presence. It is seldom found with a honey-comb structure. At places the veins outcrop boldly to the height of several feet, and at others, disappear beneath the soil. The width of the vein does not remain constant; but the general average may be put down at two-and-a-half to three feet. The San Antonio vein shows somewhat larger at the various openings than does the Trinidad; but the ore in the latter is found more uniformly distributed. Wherever the veins outcrop, openings have been made. On the Trinidad vein there are six in number; and on the San Antonio, there are seven. The different mines opened, are the El Loreto, that assayed, at a depth of 30 feet, \$70 to \$80 per ton; vein small at surface, broadens out to 2½ feet in the shaft; angle of inclination, 40 deg. north-west. La Cruz lies north-east of the Loreto; depth of shaft, 30 feet; assay, \$70 to \$90, in first opening; second, depth 60 feet;

vein 2 to 2½ feet thick; dips about 45 deg.; assay, same as former. La Falda assayed \$118 per ton. The Trinidad is the principal mine; shaft 150 feet deep, with some of the pillars extracted; some left standing, that would assay over \$80 per ton, while the ore in the lower gallery assays \$150. Water comes into the lower levels. The miners, in abandoning the property, have of course left no rich deposit in the mines; but the evidences are that an abundance of rich ore must have been extracted. The Arroyo mine was said to be very rich, and is 70 feet deep; filled with water, but could be cleared for about \$600. The San Francisco is 30 feet deep; the ore sometimes occurs in large bunches and pockets (or "bonanzas"); sometimes in small nodules, and sometimes disseminated throughout the mass in minute particles. The vein is never free from metal. The San Antonio vein has seven openings, viz., San Pedro, La Burra, Consolacion, San Antonio, Corazon de Maria, Santa Gertrudis, and Las Animas. Of the first three I can say but little in their present state, as they all need clearing out. The Consolacion is in a better state of preservation than the other two, and a fair average ore can be taken from it. The San Antonio enjoys a great reputation; but at present it is in a dilapidated condition. The mine is filled with rubbish. In the Corazon de Maria the miners left nothing rich in sight. Santa Gertrudis contains good ores, and will assay \$200 to \$500 per ton. The average value of all I saw at the mouth is \$270 per ton. The others will average \$80 per ton." By comparing the locations on the map of Col. Fleury on Sonora, Sinaloa, Chihuahua, and Durango, it will be observed that these mines, of which we have reproduced a condensed description from Mr. Jannin's report, are located but a short distance, about forty miles, south-east of Santa Cruz, and in the neighborhood of the richest mineral and agricultural region of the state, outside of the rich lands of the Yaqui River.

La Alameda is situated in the Nacameri district, 21 miles west of the pueblo of Nacameri. This mine was discovered in 1835, and was once extensively worked. The mines of this district are all of silver, with a very good "ley," about \$60 per ton.

Batuco also possesses some mines.

The Rio Chico district is in the south-western part of the state, 120 miles from Hermosillo, near the Yaqui River, is one of the most ancient mineral regions of Sonora, and in the last century produced great quantities of gold and silver.

Placers of gold were also discovered here. The gambucinos are still working some of the mines. El Aguaja is an old mineral region of the last century. Its principal mines are Guillamena, Ubarbol, and La Grande. These mines are mostly abandoned, though worked by gambucinos. Suaque contains many mines of gold and silver, which are but little worked. La Trinidad is one of the oldest mineral regions of the State, situated at the base of the Sierra Madre, on a branch of the river Mayo. Its area is comprised almost entirely of mines, the principal ones of which are worked by Mr. Alsua of Guaymas, by a modern stamp-mill, who is taking out in bullion, monthly, about \$100,000. This district is reached by a road from Sahuaripa through Babicanora, south, on the Bapepito River, a branch of the Yaqui; thence to Conichi, Ouava, Rio Chico, Nury; thence north-east to Caraja, San Nicolas, Santa Rosa, and Trinidad.

The district of Bacuachi is in the northern part of the State, as well as the copper mines of La Cananea. The gold found in this district is coarse, and pieces were found weighing 25 marcs. In fact, the whole of this region is covered with veins of gold and silver, and are as yet undeveloped. We have called especial attention to this district in another place.

Among the old mines, we may mention the Cajon, six leagues from the San Francisco placers and twelve from Cieneguilla, and those of the hacienda of Santa Rosa, near Cajon, which yielded great quantities of silver from 1798 to 1802. The average proportion of the ley of the best or picked ores was six, eight and twelve marcs to the arroba; of the poorer or second class, two to four marcs. There was a scarcity of ore in the Santa Rosa mines, on account of the hardness and narrowness of the veins. In the mines of San Francisco, water is scarce to the extreme, and could not be obtained nearer than 21 miles, and sold in the dry season at \$1 per barrel. The timber, also, in the vicinity, is unfit for building.

These mines are very rich, but the expense is too great to work them profitably. The mines of Vado Seco, to the north of San Ignacio Pueblo, on the road to Tucson, are reported to be rich, as well as the famous placer of Sobia, on the main road to the city of Alamos, half way from Barroyaca.

The Cajon district contains a group of some three or four mines, and are all owned by a New York company. The nephew of General Magruder is the superintendent, and

owns one-half interest in the mines. The mine contains gold and silver-bearing quartz, which assays, on an average, about \$65 to \$70 per ton. The deepest shaft is only down about 125 feet. Rich spots are occasionally found in the vein, but after they get down a certain distance, the veins commence to pinch out. Some of the veins have entirely disappeared. The mine has, however, paid well, as they have taken out already enough ore to pay for the claim, mills and expenses, and have now on the dump, in sight, about \$50,000 worth of ore. The mill has ten stamps, and is not quite completed, but will shortly commence to reduce the ore.

The Las Cedras, belonging to Don Santo Terminal, is situated in the district of Barroyaca, near the small town of Teropaco, 135 miles from Guaymas, in the direction of Alamos, south-east. This is a very rich mine, and has been extensively worked. It is surrounded by rich, arable lands, and a permanent stream of water flows in the vicinity of the mine. Negotiations are being made to purchase it.

During the years 1863 and 1864, many new mines were opened, among which were Las Cruzecitas, Corral Viejo and El Refugio, the latter on the border of Chihuahua, and the mines of La Cananea.

On the Cerro Prieto, between the ranchos de la Palma and La Casa Pintada, is an old mine, called Tarasca, almost forgotten. Tradition places it very rich, although it has not been worked for over a century. In this same neighborhood are many old mines, and vestiges of buildings may yet be seen on their antiquated sites.

In the district of San Jose de Gracias, a celebrated mine was worked in 1809-1810, by Juan José Carumina, who expended all his capital in bailing out the water from the old shaft, and in two or three hours, after clearing it of water, he took out a lump of ore weighing 75 pounds, which yielded 112 ounces of pure silver. The water began to gain on him again, so that in his effort to keep it down, he broke his bailing apparatus, and having contracted some debts, he could not return to his labor; the mine refilled in six or seven hours, and he abandoned the enterprise. A company afterwards undertook to clear the mine, but after expending a considerable sum, "abandoned the mine on account of an accident to one of the workmen," says Velasco. This seems incredible; but for the fact that the mines are mostly worked by Yaqui Indians, who are very superstitious, and believe that devils inhabit the mines, says Ruxton, in his "Adventures in Mexico." The accident to one of their number would prevent

others from working in a haunted mine, or one inhabited by evil spirits, in their imagination. Velasco further says: "Some of the old inhabitants of San José de Gracia, in speaking of this mine, testify that the vein in many places was of virgin silver; and that in others the ore yielded fifty per cent. of pure silver; also, that there was a stratum of red earth that yielded great quantities of gold, they having frequently witnessed the extraction of two or three hundred mares on one single occasion. The depth of this mine exceeds one hundred varas." Taking into account the unreliability of traditions, and the extravagance of some Mexicans, still there may be some truth in the tradition, as the famous mines of Batopilas, in Chihuahua, and others, have produced like results. If the mine is still in the condition that Carumina found it, a steam pump would soon reveal its hidden treasures.

The mines of La Cananea, 80 years ago or more, were worked on a large scale with great energy, by the house of Guea, of Chihuahua. We understand that these mines, or the principal ones, are owned and worked by Gov. Pesquiera, of Sonora, and are now bonded by General Lagrange, of this city. Nevertheless, we give a description of the district from the pen of the celebrated chemist, Robert L. D'Aumaille, mining engineer and official assayer for the State of Sonora.

General Pesquiera has worked five mines in this district, viz: El Ronquillo, La Chivatera, San Rafael, (or La Plomosa) La Terdilla, and La Cobre Grande. The report was written by M. D'Aumaille in 1860, and is as follows: "La Cananea is situated about 36 miles south-west of the Presidio of Santa Cruz, about 54 miles south-east of San Pedro, probably 35 miles southerly from Fort Buchanan, and not far from the American line. The mines worked are seven in number, of which the principal are El Ronquillo, La Chivatera, San Rafael, Santo Domingo, La Mina de Cobre Pobre, and La Mina de Plomo de Arvallo. In addition to these mines are La Mariquilla, (of white copper) El Tajo, (the ancient mine), and others—in fact, the whole region is strongly mineralized and of the most prepossessing exterior. The hacienda de Beneficio y Perez y Arvallo is on the El Ritto, a permanent stream at the foot of the mountains, about a mile and a half from the mines. The greater portion of the road is excellent, and the remainder can be readily made so. The hacienda is a mass of ruins, overgrown with rank vegetation. The machinery was destroyed

by natives carrying away the iron available. The situation is pleasant, on the border of a vast plain covered with wild mustangs or horses, and which stretches away to San Pedro, and contains much arable, with any quantity of grazing land, and lies immediately around the site. Half a mile or so up the valley brings us to the mine of El Ronquillo, called also from its refractory ores, La Maletiosa, with its ancient hacienda. This mine was the property of Arvallo, but the miners were driven off by the Apaches. El Ronquillo has a thickness of from three and a half to four feet of very good ore, worked to a depth of 80 feet. It has several shafts full of water to the brim, which comes from copious springs in the lower workings, and a ravine which passes across the vein, and from its situation upon the gentle slope of a hill which gradually merges into the plain beneath, it cannot be drained by a tunnel, but recourse must be had to steam machinery. The ore of this mine assayed from \$30 to \$80 per ton. Passing through the ravine, copper croppings are seen. One-quarter of a mile further, is located the mine of La Chivatera, situated on a steep declivity, admirably adapted to tunnel drainage, and is half full of water. It bears every external evidence of being a powerful vein, but we are told that it is really an irregular deposit. Three hundred yards higher up lies a great open cellar, for I can compare it to nothing else, with a small pile of refuse lying at one side.

This is the mine of Tajo, of San Rafael. Judging from the small amount of earth visible, and the statement of the old administrador, it is nearly a solid mass of ore. You have ore on all sides in the level, so that it is impossible to tell where the vein is. This ore is ductile and most easily reducible. It flows like water in the furnace. The supply is apparently inexhaustible. Further up the glen is the Mina de Plomo de Arvallo, of the same character as San Rafael. The ores of these mines appear to consist principally of oxide and sulphate of lead; although vast masses of galena are found, and are so soft that a single barretero can throw down many tons a day, while the cost of extraction is nothing. The shafts appear of trivial dimensions, yet they have been worked from time immemorial, and the litharge or jugos, from San Rafael, have supplied all northern Sonora with that necessary article; and they have even formed an article of export to Jesus Maria, and other great mining districts of Central Chihuahua. The ore of the Cobre Pobre Mine in the vicinity is boundless in extent, but

of inferior quality. Near this point is also located the great vein of La Mariquilla. We have been assured that it was in the sierra of La Mariquilla, twelve miles to the north. This mine, from its alleged dimensions, and the richness of its ores, has great interest attached to it, as the cause of its abandonment was the fact of its producing white copper, something like the "paktong" of China, or the white copper of Heidelburghausen, the prototype of German silver. But the accounts of this mine are so obscure, conflicting and contradictory, that nothing can be made of it, but actual discovery of the mine. Some have denied the existence of this mine or vein, and others claim to have smelted it, who pronounced it an alloy of copper and silver.

El Tajo, the most ancient mine, is a huge rent in the earth like the Pamys mine in Iglesia, but the ores changed at the depth of 30 feet, suddenly, into pyrites. It is probable from analogy that these pyrites are argentiferous. Immense masses of black rock were abandoned by the ancient miners in the walls, under the supposition, probably, that they were black slate, which were subsequently assayed and proved to be a semi-stratified silicate of the dinoxide of copper.

Other mines of argentiferous galena, varying from 12 to 320 ounces per ton, are alleged to exist near the Ojo de Agua de Arvalla. Besides the oak, there are vast and most accessible forests of chamunque, a species of pitch pine of great strength and durability, excellently adapted for machinery and building materials.

The mines are accessible by a good wagon road via Santa Cruz from Fort Buchanan, Tubac, La Piedra Parade, and Guaymas, and are surrounded by the great depopulated haciendas of San Bernardino, El Ojo de Agua de Arvalla, another Ojo de Agua, Cuitahaca, El Agua Escondida, Las Animas, and Banamichi.

Another road, called a wagon road, but poorly deserving the name, passes by Bacuachi, Arispe, Ures, and Hermosillo, to Guaymas. Its position is romantic and delightful. Pastures exist green in Bacuachi all the year round, and of the most nutritious quality. Cultivable land of considerable extent is found in the same hacienda, which is the natural feeder of the real. The mines themselves are said, by Felipe Perez, to be on public land, a narrow strip or sobrante between two ranchos. All the necessities of a great establishment—building material and fluxes—abound in excess. Building stone, granite, fine marble, tepustete, arenillas,

jugos and syndas are plentiful; and, during the search for the lost mines of Las Lamas, Espiritu Santo, on the road to Banamichi, a vast deposit of most refractory furnace sandstone was found, the first seen in Sonora. The water is good and the locality healthful, and in proximity to the American military stations of Fort Buchanan and Arritoypa," and the Southern Pacific R. R., which passes within about 150 miles of the district.

"ANGE ROBERT L. D. AMUAILLE,
Ensayador Oficial de Estado de Sonora,
29 de Mayo de 1860."

La Basura is the first mining region discovered in the country of the Papajos, and is situated twenty-four miles north-west of Caborca. Its veins are numerous, especially those of gold; but although they are of marvelous richness, this lasts but a short time, as the deposits extend but a short distance below the surface. San Perfecto was the second discovery made in the Papajo country. Quitovac was the third discovery, about seventy miles north-west from Caborca, and the same distance from the town of Guadalupe or Altar. The placers were first worked, they being very abundant in gold, which lay in grains on the surface, as at San Francisco and Cieneguilla. Afterwards many mines were opened to the depth of ten or fifteen varas, (about 33 inches to each vara) some of which yielded from four to eight ounces of gold to the bowl (or "batea"); others not more than a few cents. Occasionally pockets were found of large extent that yielded marvelously. Nuggets of large size were also found; one weighed twenty-one marcs, (each marc weighing 4,608 grains). A large piece of gold-bearing quartz was extracted from a ledge, that was nearly all gold, and weighed over thirty marcs. San Antonio, another placer, about ten miles west of Quitovac, was discovered a few days after the latter, and was exceedingly rich at the surface. The discovery of these placers was owing to Father Faustino Gonzalez, who prevailed upon the Papajo Indians to reveal their locality, in 1835. Gonzalez made a large fortune, and he was soon surrounded by whites and Indians in great numbers. The placer continued rich for several years, and was worked until 1841, when the Papajos rose, and expelled the whites.

After quiet was restored, a few persons returned to Quitovac and worked some mines discovered after the placers, in the neighborhood of an abundant spring, capable of supplying a population of 30,000 or 40,000 inhabitants.

In the Sonoíca Valley, which is situated about 36 miles north of Quitovac, on the road to Lower California, the gold discovered was very fine and light.

Alamo Muerto, about 48 miles west of Caborca, contains gold and silver mines and placers. It was discovered in the same year as Quitovac, and although its ores yield a fair proportion of silver, the scarcity of quicksilver prevented their being worked to any great extent. There were, however, ten mines in operation at the time of the rising of the Papajos, all of which were abandoned.

Las Palomas, six miles to the south of Alamo Muerto, were rich placers of gold, similar to those of Quitovaca. It was also abandoned for the same reason, and is now frequented by a few gambucinos, (poor miners) who are satisfied with enough to provide them with food.

El Zoñe was discovered in 1844, and contains numerous gold mines, some of them quite rich at the surface. From one of them was taken a mass of quartz of 25 pounds weight, yielding 50 per cent. of pure gold. A mine is located here called Ris Suena; eight or ten shafts are down about 300 feet. Ores are shipped to Aribaca, about 120 miles on the road to Tucson; pays about \$200 per ton.

Cajitos is situated about 24 miles north-west from Caborca, and about 70 miles from port La Libertad, inland, north-east from the Gulf of California. The mines located here are in a low range of mountains or foot-hills. The mines were discovered shortly after the other mines in the vicinity, and have been worked in a superficial manner since 1842. In 1868, the hostile Indians drove the miners off, and the mines were abandoned until 1877, when small bodies of armed men returned and worked in the old drifts and inclines for a few weeks, then packed the ore on their mules, and slipped away quietly to Basura, about ten miles east, where reduction works were established. The richest spots were thus only mined until 1879, when the mines were again worked by the primitive *arastra*. The shafts are sunk on an incline following the course of the ore vein. Instead of using the windlass, the ore is packed on the backs of miners in raw-hide sacks, up ladders made by binding cleats of wood upon an upright pole, with raw-hide thongs. The ore is worked by an iron bar called "*barreton*," about six feet in length, which is used to throw it down, using it as a hand-drill and lever. One end is shaped like a drill, and the other is hammered flat and sharp like the larger end of a pick. The ore is broken into small pieces and thus trans-

ported to the surface, to the arastras. For shovels, the horns of cattle are steeped in water and flattened out, and attached to pieces of wood with raw-hide thongs.

In this manner, these mines have been worked for the last 35 years, and about four millions have been extracted from the four mines in the vicinity. The present depth of the shafts is as follows: The Tajilos, 275 feet; Puertecitos, from 90 to 100 feet; Galilea, 80 to 90 feet; Oro Blanco, 180 feet; Santa Rosalia, 200 feet; with two levels and stations.

"The gold has only been extracted, although a large percentage of silver is found in the ore, which has been allowed to waste, owing to the lack of materials to save it. Mr. C. E. Hoffman, mining engineer of this city, although his residence is in San José, some months since was sent to Tucson to examine some mines in Arizona, and while there, met a Mexican, who showed him some of the ore from these mines, which, on being assayed, was found to be very rich. He accompanied the Mexican to the mines, was satisfied with their richness, and purchased the four mines, and thirteen others in the vicinity in the Juarez and Cajitos mining district, for himself and some gentlemen in this city, who subsequently organized the Caborca Mining Co. He returned again last April, and has been superintending their development, building reservoirs, and preparing a site for a 20-stamp mill. The water is abundant in the vicinity, which is caught in reservoirs, and the one now constructed has sufficient water to supply a 20-stamp mill for eighteen months.

"In this district the rancheros irrigate their lands by reservoirs; though grain, if sown in season, and grass, thrive very well without. Mr. Hoffman has in his employ about sixty Yaquis. These Indians perform almost all the labor of Sonora, and are employed at from 50 cents to \$1 per day. The ores of these mines assayed on an average \$8 per ton. The ores of the Oro Blanco mine in this group, assayed as high as \$224.94—about two-thirds being silver. The Santa Rosalia, about four miles from the Oro Blanco, west, went about \$151; and the Alberca, \$85.75, gold and silver, of about equal proportions. Thus we see the whole of this region surrounding Caborca is one of the richest in the state, and may be worked with enormous results. The price of transportation will not exceed \$25 per ton to Port la Libertad, and may there be shipped to San Francisco for \$8 per ton additional; although Mr. Hoffman proposes to work the

ore by a 20-stamp mill, until the mines are further developed; then add to their capacity 40 stamps more. Hay can be purchased at the mines at \$16 per ton, and wood at \$2.50 and \$3.00 per cord. The hill-sides in the vicinity are thickly covered with a heavy growth of iron-wood, mesquite, and palo-verde. The location is such that the mines can be profitably worked, and yield rich returns to the owners. The Santa Felicita mine, twenty miles east of the Cajitos Mining Camp, is owned by Mr. Davis of Chicago, who has erected a 20-stamp mill, and is working in free gold ore. The Cajon mine, twenty miles south-west, is worked by a 10-stamp mill." (From report of Mr. C. E. Hoffman.)

We are indebted to Mr. Benjamin Rountree for the following:

"The principal mine of the mining district of La Barranca, in the jurisdiction of San Javier, is the Tarumari, a silver mine, which is owned by the Barranca Mill and Mining Company, of Guaymas. The owners are, N. Graff, F. R. Rountree, F. Ench, and Arturo Culicuro. This mine has reached a depth of 300 feet, and has produced bullion to the amount of \$1,500,000. The width of the vein is from two and a half to four feet. The average assay has been, for all the working ores, about \$100 per ton. The lowest workings are upon richer ore, reaching \$160 per ton, with a vein at the lowest workings, 18 inches. The ore contains about five per cent. gold in bullion. A 20-stamp mill, concentrator, etc., are located at the mines. The ores are worked by the lixivate process, or roasting, and then passed through a wet crusher. The ores are rebellious, and, consequently, have to be roasted before treating. This mine is located about 120 miles north-east from Guaymas, and about 100 east from Hermosillo, 10 from Los Bronces, 8 from San Javier." The same company owns the extensive coal beds hereafter mentioned, which are located 1,500 feet from this mine.

The region or mining district of Bolas de la Plata is supposed to be located in the northern part of Sonora, near the boundary line of Arizona. Its importance is chiefly derived from traditions of virgin silver having been found "at the place called Arizona, on a mountain ridge about half a league in extent. The discovery was made by a Yaqui Indian, who revealed it to a trader, and the latter made it public. At a depth of a few varas, masses of pure silver were found, of a globular form, and of one and two arrobas in weight. Several pieces were taken out weighing upwards of 20 arrobas, or 500 pounds; and one found by a person

from Guadalajara weighed 140 arrobas, or 3,500 pounds," all of which has been quoted and given as a probable fact in many works, and is found referred to as a tradition in many Spanish and English works, and even quoted as a fact; since in the same year of the discovery, 1769, the Presidio of Altar seized upon large masses of silver in the possession of certain persons as the property of the crown, which was denied by the parties interested, and the matter taken into the audience chamber of Guadalajara, and from thence was referred to the court of Madrid. Seven years having elapsed, the crown decided that the silver pertained to the royal patrimony. The facts and all the data, in our opinion, can amount to no more, than that certain rumors were in existence, in relation to the products of one of the rich mines of Sonora, which had been seized by an officer of the crown: and had been found in a melted state in the mountains, at some mythical spot. The fact that the silver was in the shape of balls indicates that they were simply the ordinary products of one of the rich mines, and had been melted into the balls before mentioned, from the fact that formerly the silver in Mexico was thus melted, instead of into bars or bricks, as at present.

The following is copied from the Appendix of "Ward on Mexico," which contains a complete report of the district of Babiadora :

"In the neighborhood of Babiadora there are many silver mines, the most of which contain a greater or less proportion of gold. The principal are Dolores and San Antonio to the south-west of the town; Cerro Gordo, to the south-east, and Cobriza, on the Cerro de San Felipe, in the valley above Babiadora.

"The Cerro Gordo mine is situated four leagues south-east of Babiadora, on a very high hill, and appears to have been of considerable interest, from the great quantities of refuse ores thrown out on its sides. The quantity of water contained in it cannot be ascertained, as there is not any perpendicular shaft. From the steepness of the hill, a tunnel might be driven far below the bottom of the works, from a fine plain. The vein is about one-half yard in width. Some of the rejected ores produce from 12 to 30 marcs per 'monton,' (of ten cargass, or 3,000 lbs.)

"The mine of Cobriza de San Felipe, eight leagues north of Babiadora, and three from the town of Ituapaca, with the haciendas and ranchos of San Felipe, Agua Caliente, and Los Chinos, in its neighborhood, is said to have been aban-

done when producing pure silver, which the miners cut out in small pieces by means of large shears and chisels. The Apaches drove the miners away, and, during their absence, the shafts became filled with water, and a large rock fell into the mouth, blocking it completely up." This was in 1827.

The mine of Tacapuchi is three leagues from Babiadora south-east. The ores produce 14 marcs per monton, or about \$44.80 per 3,000 lbs.

Dolores, one league from Babiadora, produces silver in the same proportion, with a mixture of gold. These mines are all advantageously situated, with wood and water in abundance adjacent, and are distant about 70 leagues from Guaymas.

About eight leagues from Oposura north-west, are the old and celebrated mines of San Juan Bautista. The Mineral of San Juan is a mountain of itself, encircled by others to the north-west and south of considerably greater elevation. It is 3,000 yards in length from east to west, and 1,500 wide at the broadest point, and is entirely surrounded by a ravine which opens into a large plain. The mountain or hill is 600 feet high, at the summit of which the principal vein, called Santa Ana, crosses from north to south. This is crossed by another vein on the northern slope of the mountain, and is called El Rosario. These mines have produced enormously, but now contain much water.

Twelve other distinct veins are found, with small threads of virgin silver permeating the centre. The azogues, (ores that contain quicksilver) which are very abundant, are untouched, though they produce from 24 to 96 ounces of pure silver to the carga of 300 lbs. or from \$140 to \$650 per ton. The ores, by smelting, have yielded 50 per cent. of pure silver.

Tradition says that when they were compelled to abandon Santa Ana from water coming in, they left off in a vein of pure silver one-third of a yard wide.

The twelve veins vary from one yard to six in breadth. The depth to which they were worked is as follows: Santa Ana, 140 varas; Rosario, 60; Cata de la Agua, 5; Guadalupe, 4; Gazapa, 20; Texedora, 20; Santa Catarina, 20; Arpa, 12; Prieta, 12; Bellotita, Coronilla, 12; Fontane, 10. Half a league further to the north of Santa Ana is the mine of Descubridora, with a vein of azogues, (heavily charged with quicksilver) 15 varas wide; depth of mine, 30 feet;

assay, 96 ounces to the carga of 300 lbs, or about \$650 per ton, reduced by the amalgamating process.

One league to the westward is the mine called Bronzosa, or Los Bronces, with an immense vein, which may be traced one mile on the surface. It has been considerably worked, but has water in it. Two leagues further west is the mine called Cobriza, a new mine 20 varas deep. The two last have a good reputation.

The mining district of Nacosari is located 16 leagues from Oposura, and 14 eastward from Arispe. The entrance from the plain of Nacosari is up a narrow glen two leagues in length, through which flows a tolerable stream of water, which is lost in the sand.

About one mile from the entrance, during the rainy season, it reaches to Ojo de la Agua, the source of the Oposura River. Just before you arrive at Nacosari, the glen expands into a beautiful vale, planted over with a variety of ornamental shrubs, fig trees, pomegranates, peaches, and other fruits and plants, which were once arranged with order and taste, but now form a confused thicket. The remains of numerous canals are visible, through which water was conveyed to every part of the vale. This spot was once a residence of Jesuits. The remains of their dwellings and an old church at the upper end of the valley are yet to be seen. The surroundings are picturesque. The mountains on each side rise almost perpendicularly, and are intersected with strata of a great variety of colors. Some of them present a mixture of bright red, yellow, green, and other varied tints.

There are many excavations in the mountains, and the principal mine is called San Pedro de Nacosari. This mine is a phenomenon. The vein runs east and west, and is laid open from the surface for more than 1,000 varas, to the depth of 70 varas. The breadth of the aperture is about two yards; but on each side are immense quantities of rubbish thrown out. Much dirt and sand have washed in and covered the vein; but general report says that the mine has no water in the interior, and that the ores were so rich that the best yielded from 25 to 30 marcs of silver to the arroba (of 25 lbs.).

The mines of Churunibabi, Pinal, Huacal, Aguaje, and many others, are situated to the north and north-east of Nacosari, at no great distance from San Juan del Rio, built upon a stream which falls into the Yaqui. These minerals are equally rich with those already described. Pinal con-

tains a greater proportion of gold than silver. It is recorded in the archives of Arispe, that the former owner, a lady by name, loaned quite a sum to the government. Churunibabi is a very old mine, worked in the same way as the San Pedro, as, indeed, are all the mines in this part of the country. The direction of the vein is east and west, width two varas. The last persons who undertook to work this mine, were named Escalante, Vasquez, and Coulla. They cleared away the rubbish at one end until they found a pillar left to support some of the old workings, from which they took ores that produced \$70,000, and yielded 70 marcs of silver per carga of 300 lbs. The mine is laid open from the surface 400 yards in depth. Tradition says that the first discoverers found the vein of virgin silver one-half vara wide, (or about 16 inches) and that it was abandoned, on account of the Apaches, when the vein was two varas or 66 inches wide, (5½ feet) and the ores assaying 70 marcs per carga, or about \$1,500 per ton. The richness of these ores appears almost incredible; but when we consider the great quantities of bars of silver the mines of Sonora, without the aid of quicksilver, have produced, the metals must have been very rich and abundant. Ten leagues to the west and south-west of Nacosari, and six to the north of San Juan, are the mines of Tonbarachi and San Pedro Virguillia, with ores of from six to eight marcs per carga. To the west of Arispe are the mines of Santa Teresa, of gold and silver completely virgin, and the Cerro or Mountain of San Pedro, which contains innumerable mines and veins untouched. In all the districts above described, the roads are only passable from the public roads for horses and mules. The country being very mountainous, but not of very great elevation, none of these mines are more than six or seven leagues from rapid streams of water, sufficiently considerable to work almost any machinery. The mines of Aigame, or Haygame, near Horcositas, are famous for the abundance and richness of their gold-bearing ores. Those of Lam Pozas and Palos Blancos, five leagues west of Tepachi, are likewise good mines, with considerable veins carrying rich ores."

Concluding Reflections on the Mines of Sonora.

The business of examining and reporting on mines is a secret one, and, therefore, an attempt to give a complete description and location of mines in a country comparatively but little known, is an exceedingly difficult matter, from

the fact that the territory embraced within the limits of Mexico contains a rich harvest for our mining experts, and, with them, most of the knowledge of that mineral region reposes.

We have no desire to antagonize the interests of any one, but simply to give all the data that can be obtained of interest and possible value to every one whose attention has been drawn to Mexico. We have on hand much data that we were compelled to condense as much as possible, and which we will give more fully at a future period. That the mines of Sonora present a rich field for mining operations is plainly indicated by the foregoing sketch of the mineral wealth of that region, and although the territory of Arizona presents an extensive field, yet it is but the border of an ancient and very rich region lying south in the Mexican Republic.

Although there are many old mines that have been but comparatively developed, yet the innumerable ledges of gold and silver bearing ore that lie untouched in that sparsely-settled region invite the American miner to their almost inexhaustible riches. The able and impartial writer, Francisco Velasco, describes this portion of the Mexican Republic in glowing terms, with somewhat of the profusion of Spanish mining literature; yet he has been more conscientious than many interested Mexicans would desire; and where he has given unfavorable reports, we may be sure of having arrived somewhere near the actual state of facts at the time his book was written; and we quote the following valuable information as to the actual condition of most of the old mines. He says: "that although *experience goes to prove that the mines of Sonora are generally sooner exhausted than those of Guanaxuato, or Zacatecas, this rule has many exceptions.* It should also be borne in mind that many mines in the last century were abandoned in good condition; and among other reasons, the following may be cited: the owners of these mines were generally Spaniards, who regarded the poorer ores as of no value, as they had no establishments for their reduction on a large scale, and confined their labors to the richer ores and virgin silver, which they frequently encountered. When they were no longer found in abundance, they contented themselves with what they had already gained, and abandoned the mine, which naturally became choked, or full of water. The gambucinos, who then took charge, generally confined their operations to the pillars, and left the mines in a most ruinous condition. Windlasses, or pulleys,

were almost unknown; and where the mine could not be kept free of water by buckets, it was abandoned." All of which plainly indicates that old mines, as a rule, had better be very closely examined before any extensive outlay is entered upon; and since the mineral wealth of Sonora is almost unlimited, a good, new mine, with paying ore, or an old mine with present evidence of its richness, is better than abandoned or exhausted mines with a past reputation of almost fabulous wealth. *When a mine has produced its millions, generally there is not much paying ore left to warrant an extensive reopening.*

The Santa Clara Coal Fields of Sonora.

"These coal fields are situated in the district of Ures, Jurisdiction of San Javier, and Mineral or mining district of La Barranca, about 100 miles due east from Hermosillo, and about 120 miles north-east from the port of Guaymas, four miles east from the Barranca mine, about 12 miles east of the town of San Javier, and about three and a half miles west of the Yaqui River.

"These coal beds were first denounced by William Lubbert, Napoleon Graff, Thomas Mahan, Frank Ench, and Antonio Cubillos, on the 26th day of April, 1872. At the present date the property is owned exclusively by N. Graff, Florence R. Rountree, A. Cubillos, and F. Ench. The title of the above property vests in said parties, and is free from all incumbrances up to Jan. 1st, 1881, when, at that date, the property was bonded to Charles A. McQuesten, of this city. The property is held by the above-named parties as an association.

"The property consists of extensive deposits of anthracite coal," with some appearances of being partly bituminous, which indicates that there must be extensive coal beds of both anthracite and bituminous coal. "The coal beds denounced are contained in one square league of land. Up to the present date two well-defined veins of coal have been exposed.

"The first consists of a vein nine feet six inches thick, that has been developed by explorations and examinations on the side of a mountain.

"In some places, the vein is within about from one to four feet from the surface. This vein can be traced for about 1,000 feet horizontally, and about 500 feet above the base of the mountain, and extending toward the summit of the

mountain. One extensive tunnel has been run on this vein, following its dip. No explorations have been made above the point above mentioned; but indications show that this vein has a much larger area. The incline of the vein is 20 degrees S. S. E., the dip east by north-east. At a distance of 22 feet below the point of location of the above-mentioned vein is another vein of about seven feet in thickness. This vein is reached by a shaft on the opposite side of the creek, on the side of the mountain opposite. On the side of the mountain, several excavations have determined the thickness of the vein. At the foot of this mountain is a cañon about 100 yards wide, on the opposite side of which rises a high and rugged mountain. This cañon is about six miles long, commencing at the Taramari mine and ending near the Yaqui River. The coal veins are about one-half the distance between these points, or about two and one-half miles from the Yaqui River bottoms.

"The bed of this cañon can be made into a good wagon road with little work, from the coal veins to the river. Water is found in the cañon at a depth of eight feet. In many places in this cañon, slate and many indications of coal are found. The geological formation of the vicinity and the character of the coal is as follows: The mountain ranges in the immediate vicinity of the coal are very rugged, with steep sides, covered with trees, cactus plants, and other tropical vegetation. The average elevation of the range of mountains is about 3,000 feet above the sea level.

"The range of mountains is continuous for over 100 miles running north, and about twenty south, of the location of the coal beds. They form the mountains bordering on both sides of the valley of the Yaqui River. Placers of gold that have yielded very richly, are located near the valley of the Yaqui, one man having in a single season extracted \$30,000 from this same cañon where the coal beds are located. The Yaqui River is about three-and-a-half miles from the present workings of the mine; and the coal mine is very easy of access by a road to be constructed through the cañon, up a gentle incline. At present there is no road for wagons. Horses and mules are therefore used to reach the mines. With very little work a wagon-road could be constructed, or even a railroad, direct to the river's bank. For a distance of about ninety miles from the mouth, the Yaqui River is navigable for barges or flat boats; and at this point rocks and rapids impede a further passage, except for small boats, which are carried around the rapids by "carriers," at the

mouth of the cañon opposite the coal fields. The river at this point is about 200 feet wide and four feet deep, during the dry season; but during the rainy season a considerable increase in the volume of water takes place. Engineers state that the river can be made navigable for barges from the point opposite the cañon before mentioned, to the mouth of the river, a distance, by following the course of the river, of about 120 miles. The Yaqui River lands, for a distance of 100 miles above its mouth, are noted for the richness of the soil, and the large crops, "as before mentioned." "A railroad can easily be built from the mine to the river, and following near the different windings of the river north, to enter the United States near Tombstone, where a market can be found for a large quantity of coal for milling purposes, and also for smelting furnaces, used to smelt the rich argentiferous and galena ores that abound in that region; and also through northern and middle Sonora, where hundreds of mines containing smelting-ore require a coal suitable for smelting purposes; or south, through the rich valley of the Yaqui River bottom, where millions of acres of the finest land in the world are awaiting the emigrant to cultivate its soil; and on to the port of Guaymas, where a market can be found for a large amount of coal for steamers that regularly ply from San Francisco and that port, and for vessels of war of England, United States, and other nations, that regularly touch at Guaymas.

"From Guaymas, barges can ply between that port and Mazatlan, or Cape St. Lucas, in Lower California, where a depot of coal could readily find a sale in supplying ocean steamers that ply between China, Japan, Australia, Panama and San Francisco, with a prospect in the near future of supplying coal to the fleets of steamers that will ply through the Isthmus of Panama Canal. Barges could also take the coal direct from the Yaqui, up the gulf, to the Colorado River, to Yuma; there supplying the steamers on that river, the several railroads that pass over this river, and the mills on and near this river, where steamers now go up a distance of about 200 miles from Yuma. Vessels could also transport this coal direct from the Yaqui to San Francisco, where a ready demand for anthracite coal will result in large sales, as at present all anthracite coal used in San Francisco comes from Pennsylvania." (Extract from the report of Charles A. McQuesten, of this city, on the Santa Clara coal fields of Sonora.) We might add that the Mexican Congress has lately approved of the concession to

Mr. Robert R. Symon for the construction of a railroad from the above coal fields to El Morrito, on the Bay of Guaymas. Thus it will be seen that this coal will soon be on the market.

Quicksilver, Graphite, Marble, Copper, Lead, Coal, Iron, Etc.

The ores of the mines of Santa Teresa and Santa Ana contain quicksilver, and tradition says that the mineral region of Rio Chico also produces this metal.

In San José de la Pimas there is a small hill entirely composed of graphite or black lead.

In San Javier is a vein of a dark color on the face of a hill, from which is extracted a compact substance which, when dissolved in water, produces a fine ink, which is similar to India ink, from China.

In Oposura, there is a hill composed of excellent marble, of which the altars and churches of Sonora are built.

At Ures, there is also another marble quarry.

The celebrated hill of "La Campana," in the city of Hermosillo, is composed entirely of marble as white as that of Italy, and it is used, in some instances, to pave the streets. Alabaster and jasper are found also at Oposura and Ures. Copper is found in the mountain range of La Cananea, north of Arispe.

Aduaña, (an old region of gold mines) Tonuco, 36 miles west of Hermosillo, and Bacuachi and La Cobriza, west of Horcasitas, all contain copper ores.

Lead abounds in Cieneguilla and Arispe, Batuco, San José de Gracia, Aduaña, and Promontorio.

Agua Caliente and Alamo Muerto contain lead, although it is found in the greatest quantities at Cieneguilla and Arispe.

Coal is found near Los Bronces and La Baranca, before mentioned, where a vein of from seven to nine feet is found.

Iron is found in abundance in the southern part of Arizona, in the range of mountains called Madera, and in the northern part of Sonora, and at Mogollon.

In the neighborhood of Cucurpe there is a vein of incombustible crystal.

SINALOA.

CHAPTER I.

General Description.

From the river Mayo to Alamos, in Sonora, the country is an extension of rolling hills, and from thence down to the coast and the valley of the river Fuerte, bordering Sinaloa. Here the "tierra caliente" plain is encountered that extends all the way down the coast, through the whole length of the State of Sinaloa. The town of Fuerte is located on the river Fuerte, about 80 miles from the mouth. The river is navigable for flat-boats up to this point. An extensive valley below Alamos extends almost due south, between the mountains on the east and the low range of hills on the west, until it opens into the valley of the Fuerte and the plains located south. The Fuerte River is about 200 miles long, and rises north-east in the Sierra Madre, and flows south-west into the Gulf of California. The next river encountered is the Sinaloa, which rises in the neighborhood of the south-western part of Chihuahua, and flows in a south-westerly course, describing a section of a circle through placers of gold situated east of the town of Sinaloa, about 25 miles. Here the river winds in a curve to the east and again to the west, within a space of about eight miles, then continues its course, passing the town of Sinaloa, situated on its banks, and flows south-west into the gulf. A small peninsula completely hides its mouth from the open waters of the gulf. Another peninsula juts out in an opposite direction, forming a very good harbor for small vessels. The river is about 180 miles in length. The Mocorito Arroyo or creek is next crossed, and another small stream, until the river of Culiacan is reached, which rises in the western part of Durango, near Tamasula, and flows south-west into the gulf, the mouth of which is also hidden behind an island, forming a very good roadstead, called the

Puerto de Altata. The city of Culiacan is located on the banks of this river, opposite the point where the Rio de Hamaya empties into the Culiacan River. This river is about 150 miles long, and on each side of it spurs of the Sierra Madre jut out into the plain within about 30 miles of the coast; the valley of Culiacan being at this point 15 miles wide. The Rio de San Lorenzo is next reached, that flows south-west direct into the gulf. The great mining district of Cosala lies south-east of this river, near its source; the town of Cosala being about 10 miles south from its banks. This river runs through a valley of narrow width, the whole distance, until it reaches the plains beyond.

A valley branches from the valley of San Lorenzo up to Cosala, with a gentle incline, when it again commences to slope on the other side down a valley or cañon to the Elota River. This river also rises in the western part of Durango, and flows south-west into the gulf. This river is about 110 miles long, and has numerous branches. In the neighborhood of its branches, in its cañons and ravines, and on the slopes of the mountains adjacent, are some of the most celebrated mines of gold and silver in the state. The Rio de Piastra also rises in Durango, in its western part, near the celebrated mines of San Dimas, and flows south-west, passing San Ignacio, and empties into the gulf. The valley of Piastra is also very narrow; but some exceedingly fertile lands are found in its bottoms, as in many other portions of the state.

Another small arroyo is reached, and we enter into the thickly-settled region adjacent to the city of Mazatlan. The port of Mazatlan is located on the coast, about half-way between the mouth of the arroyo last mentioned and the river of Mazatlan. This river also rises in the cañons of Durango, about 20 miles across the border line of the state of Sinaloa, and beyond the mines of Ventañias, and flows south-west about 50 miles, and then takes a course almost due south, and empties into the gulf, or rather Pacific Ocean; the mouth of the Gulf of California being now reached. The point where the river discharges itself into the sea is about 15 miles below Mazatlan City. The Rosario River also rises across the border line of the state, in Durango, and flows south-west, into the ocean, passing El Rosario, in the neighborhood of which are located some very rich mines. Above the mouth of this river, and lying in from the coast, is located the lagoon or lake of El Caimanero, which is about 12 miles long, and about 4 miles in width at its widest point.

The Rio de las Cañas, at the southern border of the State, separating Sinaloa from Jalisco, flows in the same direction as the Rosario River, and empties into the bay or lagoon of Boca de Tecopan, a narrow inlet of the sea which winds into the plain about five miles, and then spreads north in a narrow body of water about ten miles, and south about thirty-five miles, into an extensive body of water in the southern part. It is said it may be made one of the finest harbors in the world, and would contain all the fleets of the globe. With such a harbor as this at Mazatlan the most powerful city of the Pacific Coast would spring up upon its shores. This harbor is located about fifty miles below Mazatlan. The Tierra Caliente plain, before referred to, is about 300 miles long, and intersected by the rivers and streams before mentioned; and at its widest part is about forty miles in width, with extensive valleys branching up the banks of the rivers, some of which are 100 miles in length—the valley of the Fuerte being the largest. The foot-hills of the mountains are covered with timber, such as cedar, and the varieties of oak. The State of Sinaloa extends over an area of nearly 3,600 square miles, and has a population of about 200,000. The surface of the plains of the coast is low and somewhat sandy, though the soil is very fertile. Its productions are similar to Sonora, though to a less extent. Dye-woods abound on the coast and toward the Sierra Madre, and on the eastern frontier there abound extensive forests of pine and cedar covering the mountain sides adjacent to the streams. The rivers flowing into the gulf are used to irrigate adjacent land during the dry season. The state is divided into nine districts, viz., Mazatlan, Rosario, Concordia, Cosala, San Ignacio, Mocorito, Fuerte, Sinaloa, and Culiacan. The state is bounded on the north and north-west by Sonora; and north and north-east by Chihuahua; and east by Durango; and south-east by Jalisco; on the south-west by the mouth of the Gulf of California. The north and north-eastern portion is very mountainous, while it is more level on the coast, which is drained, as well as the mountains adjacent in the north-east, by the rivers before named. The interior contains mines of considerable extent, some of which are very rich, to which we will give some attention hereafter. The interior valleys are very fertile, especially the valley of Piastra, on the Piastra River, and the valley of Rosario, about twenty miles south-east of Mazatlan. There are about 100 towns in the state, and out of the latter, Mazatlan, Culiacan, Cosala, Rosario, Fuerte, and Sinaloa, are

the most prominent. The first town reached of any importance is the town of El Fuerte.

The situation of the town is charming, being on the south bank of the Fuerte River. This river is about a quarter of a mile wide, and passes along the foot of a plateau that is elevated about 90 feet above its bed. There is a fair view both up and down the river, from this plateau. The town of Fuerte has about 1,000 inhabitants, and should be the principal inland town of the State.

There is no commerce at Fuerte, from the fact that its advantageous natural position is no protection from the competition of Alamos on the north and Mazatlan on the south. The valley in which the town is located is one that might be one of the most fertile in the State and can be easily irrigated from the river, and will raise corn, wheat, sugar-cane, cotton, and the various cereals, but the inhabitants prefer to use this magnificent valley for grazing purposes, and raise chiefly stock. The mules raised here have the reputation of being the best in the State. The road from Fuerte is of the same character to Mazatlan, passing through Mocorita and Sinaloa.

The principal family at Fuerte are the descendants of A. Ybarra.

Ward, in his celebrated work on "Mexico," says of Fuerte:

"The situation is not particularly favorable, as, notwithstanding the vicinity of the river, the country about the town is unproductive, and the heat in summer intolerable.

"The Tierra Caliente of Sinaloa extends from El Fuerte, or rather from Alamos, to the confines of Guadalajara (Jalisco). It is one vast, sandy plain, destitute of vegetation, except in the rainy season, or in spots where the vicinity of the mountains or the confluence of two large streams insure a constant supply of water.

"This is the case at Culiacan, the most ancient and populous town in Sinaloa, situated upon a river of the same name, 80 leagues south of El Fuerte. It contains 11,000 inhabitants, and the country about it is well watered and highly productive."

Of Cosala, he says: "Cosala, 35 leagues south of Culiacan, is the next town of any note on the road to Jalisco. It derives its importance entirely from its mines, one of which, called Nuestra Señora de Guadalupe, is very celebrated. Guadalupe is free from water, and situated at a considerable elevation above the plain. It contains a vein of gold of consid-

erable breadth, and its produce might be increased to ten times its present amount, etc."

From Cosala to the capital or City of Mexico, or the Central States of the Republic, there are two routes, the one by Rosario, the Cañas and Guadalajara, which is impassable during the rainy season, and the other due east from Cosala across the Sierra Madre to Durango. The distance from Alamos to Fuerte is 35 miles. This place was originally a military station, but the military are now removed to Mazatlan.

The town of Sinaloa is located on the river of the same name, and has about 1,500 to 2,000 inhabitants. The principal business of this place is in the production of Indian corn, pork, and lard, which is exported. The principal business men are Francisco T. Penna and N. Nuñez, who are in both the wholesale and retail trade, and H. Carubbio. The town of Sinaloa is located on a small river, and in the winter or dry season it dwindles to a very small stream. The seasons are reversed in the State. They have their dry season while we have our wet, and the reverse. The district around is fertile, and produces the usual agricultural productions, though the principal trade is as we have stated.

The town has but one street. The ladies of this town are celebrated for their beauty in the whole State, as those of Hermosillo are famous in Sonora.

Roads of the State.

A stage runs from Guaymas to Alamos over the old road, which runs east back of the bay, or north of the inlet formed by the mouth of the Yaqui River, crossing the small stream of San José, and the river Matape which flows into the gulf; thence to Torin on the banks of the Yaqui River, a distance of about 80 miles. The river is here crossed by a ferry in wet seasons, and forded in dry seasons, to Bocam, and thence north, following the course of the Yaqui, to Cocori, about 20 miles; thence to El Baihoca and south to Coraque, due east of Bocam, and distant in a straight line only about 15 miles. This short cut can be taken and save about 35 miles of useless travel. From Coraque the road runs south-east to Camoa on the opposite side of the Mayo River, which is here crossed at a distance of about 35 miles from Coraque; thence to Alamos, about 12 miles. From Alamos to El Fuerte the distance is about 35 miles, where the Fuerte River is crossed; thence almost due south to Sinaloa,

about 60 miles; thence across the Sinaloa River and on to the Mocorito River and the small town of Mocorito; thence south-east through Palmas to La Morita; and thence taking a more southerly course to Culiacan across the Culiacan River, distant from Sinaloa about 85 or 90 miles. Here two routes are presented to Mazatlan, one by way of Cosala, which takes a south-east course through the small towns and ranchos of Las Arayanes, Las Flechas, El Vichi, Las Milpas, Santa Anita, and Casa Blanca on the small stream of San Lorenzo; thence crossing the stream east to Las Vegas, Carriscal, Higuiera, and Cosala, a distance of about 60 miles; thence south, passing Calafanta, Conitaca, Salado, crossing a small branch of the Elota River; thence to Laguna and Elota, about 40 miles from Cosala. The other route from Culiacan runs south to Aguarita and El Carriscal, El Salado, and San Lorenzo on the river of that name. The river is here crossed and a south-east course taken to Avaya, Vinapa, Higuierita, and thence east to Elota on the Elota River. The former route is the most traveled, though longer, as it passes through the rich mining region of Cosala. The latter route is over a stretch of about 80 miles, while the former is about 100 miles. From Elota the road is direct to Mazatlan, distant about 55 miles south-east, crossing the Elota River, and Piastla River at Piastla; thence to Coyotitan, Quebrachi, Quelite, Comacho, Aval, Los Otates, and Mazatlan. From Mazatlan a road runs south-east to the Presidio of Mazatlan, and east to El Rosario on the Rosario River; thence south-east into the state of Jalisco to Guadalajara and on to the capital of Mexico.

The road from Fuerte to Mazatlan and Rosario is a good one, to which we have referred already, and is used for wagons and a stage line constantly during the dry season, but it is impassable during the wet season on account of the lack of the bridges over rivers that are swollen to a dangerous depth and swiftness, and the roads being of clay and sand become boggy. Another road, or rather mule trail, leads from Mazatlan through San Sebastian east and then north, passing many ranchos on the Mazatlan River, to Morito and east, where the river Mazatlan is crossed twice on account of a bend in the river, and on up the Mazatlan Valley into Durango; passing Favor in Sinaloa and Saulito in Durango, and other towns up the cañon to the mines of San Antonio de las Ventañas, and the celebrated mines of Guarisamay, and from thence on to Durango, about 150 miles distant from Mazatlan.

CHAPTER II.

Mazatlan.

The coast adjacent to Mazatlan, with its mountain peaks in the background, presents a grand and imposing scenery; and during the rainy season, when the valleys, hills and mountains are covered with verdure, it is one of the most beautiful spots on the coast. The small sugar-loaf mountains rise frequently, near and in the distance, presenting a variety of scenery to the eye that is very pleasing, and to lovers of scenery, it is delightful.

The port of Mazatlan is not capacious, nor surrounded by those safe landmarks characteristic of many of the ports on the Pacific Coast. For fear of the southerly or south-west winds, no vessels can be anchored long in the harbor, as the land is low adjacent, and on the south-west mostly open to the ocean. For this reason, vessels only stop long enough to unload, and proceed on their way. The inner harbor is far from admitting heavy merchant-vessels like the clipper ships arriving in the port of San Francisco. The approach is safe, however, for ocean steamers to approach and retreat when touching at this port. Larger ships anchor under the lee of the island of Creston, which is rather small, but much elevated. In this harbor there are two other islands, called Venado and Pajoros. The dangers to vessels during the stormy season detract much from the commercial position and advantages of Mazatlan; and, for that reason, Guaymas, in Sonora, will be the principal port for the vessels passing up the Gulf of California.

The city of Mazatlan is nearly surrounded by water, a mere tongue connecting it to the mainland. Near the water's edge, and back half a mile, the surface of the site is even, and also to the limits of the city, from the fort on the west, for more than a mile eastward; yet, farther back, it is uneven and ungraded. The fort commanding the inner harbor to the city is located on the side of an elevated plateau, near 1,500 feet above the sea. On its summit, one may enjoy the beautiful scenery spread out before him—a panorama of mountains, low undulating hills, and valleys. In this fort are planted some antiquated cannon, commanding the city and harbor. The streets are not laid out regularly. One main street runs from the water front out into the country beyond, on which are located the retail business houses. The wholesale houses are situated on the streets of

the water front. The whole number of shops and stores reach as many as 500. The buildings are mostly constructed of soft brick, one foot square, and, in some instances, there are stone buildings. Adobe houses are mostly occupied by the poorer classes in the suburbs. Most of the buildings are one-story; yet, in some few instances, the houses built by foreigners are two stories high. The houses are constructed roughly, and plastered inside and out, and afterwards penciled. The roofs and floors are made of brick. For the floor, the ground is raised, and surface leveled, and bricks laid in cement, which makes the floors both durable and cool in the summer. When the floors are carpeted, wool or common cotton is laid down first, then the carpet. Among the poorer classes, no carpet is used, but a native mat. Heavy joists and close together are laid across the walls of the building for the roof, and on these a tight floor of boards is laid, and on this the bricks are laid, one foot in thickness, cemented completely water-tight. The walls are commonly three feet thick, making each house a complete fortress, and, withal, very cool in the summer season.

The style of architecture is a mixture of the Moorish and Gothic. The doors are clumsy and large, generally fastened inside by wooden bars. The windows have mostly iron gratings of three quarters of an inch in diameter, and sometimes shutters, making the city look like a city of prisons. The inside walls are frequently papered, and the houses well and even elegantly furnished.

Most of the goods sold here are imported directly from Europe, and German houses seem rather to take the lead in commercial pursuits throughout the country. There are about 100 foreigners in the city, mostly engaged in commercial pursuits, and they are said to own most of the real estate in the city.

Gold, silver, and copper, and dye-woods are shipped from this point in large quantities. Many ship-loads are packed in from the interior on the backs of mules. "Burros," or she-asses, are used, to some extent, to pack mortar, bricks, lumber, etc.; but freight wagons and carts are also used, drawn by mules.

The streets are mostly paved with round cobble-stones, and in a concave form, so that the water drains off in the center. These stones are laid in cement, and become quite firm, so that they are not easily misplaced, except during the rainy season. The sidewalks are narrow, some made of hewn timbers, and laid so that two persons can walk side by

side. Others are constructed of soft burnt bricks and flagstone. On any of them, but two persons can walk side by side.

The government buildings, such as the custom houses, forts, and arsenals, are well constructed, airy, and remarkably adapted to the torrid zone. These, as well as private buildings, have a species of rain spouts, which, in the rainy season, scarcely extend the dripping waters from the sidewalks. There is one church in Mazatlan. The composite architecture of beautiful constructions of arches and pillars give some of the buildings quite an imposing appearance. There are two principal hotels, kept by Frenchmen, who charge about \$2.00 per day. Inside the court-yards, flowering shrubs, rare bushes, the hyacinth, and the trailing vine are frequently seen. The delicate and refined taste of the ladies of Mazatlan is well known in the republic, and their beauty rivals the maids of Hermosillo. A public plaza is tastefully laid out, with seats on the sides of the square, made of brick, having brick sides, and painted red, with brick walks through the center, coinciding with either point of the compass, and with a circular brick walk inside the seats around the whole circuit of the plaza; and to enhance the beauty of this, every 15 feet orange trees are set on the inside edge of this circular walk, which truly adds beauty to the whole scene. A beautiful fountain of crystal water plays day and night.

The marketing is done principally on Sunday morning on the market square, where purchases are made from the country people for the week. Indian corn, beans, Irish potatoes, sweet potatoes, eggs, red peppers, bananas, plantains, oranges, limes, several species of custard apples, squashes, pumpkins, watermelons, muskmelons, chickens, turkeys, and a variety of gallinaceous birds, such as the "hoco" or "curassow" and pheasants; also, crockery ware, chairs, and other articles are not unfrequently exhibited for sale. After the sales are ended, to the inhabitants of the city, the balance are bought by local hucksters at a reduced price. A theater is in the city, where the beauty and *élite* gather to listen to Spanish plays of love and tragedy.

Mazatlan is now a commanding commercial city of rapidly growing importance to Lower California, southern Sonora, Chihuahua, Durango, and northern Jalisco, and the state of Sinaloa.

Vast regions of agricultural, grazing and mineral lands are adjacent, untouched, that await development by foreign

capital and industry. Most of the trade of all this region passes through Mazatlan.

This city has but few equals for its surrounding advantages, and invites to her municipal confines an intelligent class of immigrants, who will develop her latent energies and resources.

Sailing-vessels go leisurely up the gulf, carrying the productions of the south, though the greater part of the carrying is now done by steamers. The principal freight is sugar, coffee, rice and tobacco, with foreign and domestic merchandise. These are exchanged for flour, fruits, gold and silver, copper, pearls, salt, hides, and tallow. Some considerable sugar, cotton, rice, corn, beans, etc., and tropical fruits are produced in the rear of Mazatlan, in the Mazatlan Valley, which is 45 miles wide in its widest part, nearly one hundred miles in length, and well watered by the Mazatlan River.

Land can be cultivated three miles on each side of the river, on the river bottom lands. There are about 17,000 inhabitants in the town. The river, which empties into the sea, is 100 yards wide in rainy seasons, and is navigable for large barges, for five months, some distance up the river. The stage crosses in barges. The country east of Mazatlan is mostly level to the base of the mountains, diversified by rolling ground. There is one large cotton factory in the city, which manufactures the cotton raised in the vicinity, into goods that are purchased by the inhabitants of the region surrounding. This is a great cotton country, and timber is plentiful.

Coal has been found seventy-five miles from the city, with a vein cropping out three feet in width, something like anthracite. An interior valley, of 30 to 40 miles in width, at the widest point, lies beyond the Sierra Madre, east of the city, 40 miles from the river Mazatlan. Rich mines have been found near Cosala. Grazing is carried on extensively. The city commands the trade and supplies the wants of the country people and the inland towns within two-thirds of a circle from 200 to 1,000 miles in the interior.

Rich merchants come in from the country with pack-trains, who have extensive haciendas, gold or silver mines, or who are exclusively engaged in commercial pursuits. The roads, or rather trails, through the mountain districts are not very good; and the rivers, in the rainy season, being mostly without bridges, present serious obstacles during that season for travel in the interior. The rainy season commonly in-

cludes the months of June, July, August, September, and a part of October; and during most of this time it rains a little nearly every day. Most of the flour used in Mazatlan, Tepic, and Colima, and the ports of San Blas and Manzanillo, is exported from Guaymas, in Sonora. The flour is nearly as white, possessing the same qualities, as California flour. From Mazatlan to the mouth of the Rio Grande, in Texas, near that point it is nearly six hundred miles; and a railroad from this city to the mouth of that river is practicable, and can be made by passing over a distance of 1,000 miles. To Laredo, in Tamaulipas, on the Rio Grande, it is not much more; the latter point being the point of connection with an eastern road running from the City of Mexico, almost due north. A better route, however, might pass Guadalajara, and connect with that road south of Laredo. The City of Mazatlan will be unquestionably a powerful rival of San Francisco. On the low land there is not much cultivation on a level with the sea.

The hacienda or rancho Tamaulipas of Piastra, on the road to Culiacan, contains about 30,000 acres, and is situated on the Piastra River, about seven miles from the coast, the whole of which can be cultivated, and is easily irrigated from the river. The stream, during the wet season, is navigable as far as the rancho. This rancho is owned by the Laveagas, but is not for sale. There are small ranchos, however, in the vicinity for sale. There are also very fertile lands near the Rio de Rosario, twenty miles south-east from Mazatlan. On this river, and throughout the country, land is cheap. Haciendas of one, two, and three leagues in extent, can be purchased for one, two, three and four thousand dollars.

Corn sells from 50 cents to \$1 per bushel; beans, \$9 per carga; oranges and limes \$10 per thousand; sweet potatoes, 6 to 10 cents per lb.; beef, pork, and mutton, from 6 to 10 cents per lb. Poultry and eggs are high. Butter is sent here from Guaymas, but it is of a whitish color, and almost tasteless. The cheese is no better. Lower California furnishes large quantities of this cheese for the market of Mazatlan. An industrious American might settle in the vicinity of Mazatlan, and following most any pursuit, such as gardening, keeping a dairy, or even agriculture, he could accumulate a snug fortune, and in a short time retire from business, living in comparative ease and affluence.

The principal business houses are: Rogers & Marshall, Juan Cristobal Farber, Edward Coffey, Budwig & Rasch, Isaac V. Coppall, Charpentier, Reynard & Co., Peña & Co.,

Hernandez, Mendia & Co., Bartning, Hermanos & Co., Melchers Sucesores, James Hermanos, C. Goldschmidt, L. Cannobio Hermanos, Diaz de Leon Hermanos, M. Magaña, Maxemin Hermanos, J. Kelly & Co., F. Echeguren Hermana y Sobrinos, J. De la Quintara & Co., Haas y Encinas, F. Telleria & Co., T. Heyman & Co., Lewels & Co., Vicente Ferreira y Co. (foundry) Calisher & Jacobs, J. La Mazatleca and J. Gallick Bros. & Co., Lewis Loeseke, Ignacio Escudero, and many others, among whom we mention Señor Crouzet.

The implements used in husbandry are of the most primitive character in some portions of the state. The plow consists of two poles, one six feet long, and the other fifteen feet, fastened together by the means of a mortice and tenon, at an angle of sixty-five degrees. Through, and near the end of the short pole, there is a pin to steady the plow; and on its end there is attached a pointed iron or steel shoe to prevent it from readily wearing out. The yoke has no bows, but is fastened on the heads of the cattle by means of raw-hide thongs, and so is the tongue of the plow to the yoke. With this rude instrument the ground is merely scratched over about three inches in depth, and yet the soil yields marvelously. The scythe, the cradle or the sickle, even, are unknown in some places, with the hoe, or any other common implement of husbandry. Reapers and threshing machines are not even dreamed of in some isolated instances; but they have been introduced in many of the states of the republic. Here is a rare chance for our agricultural implement manufacturers almost at their doors.

About one-twelfth of the population of Mazatlan is white, and can trace their origin back to their Spanish ancestors. Many blondes are seen who are direct descendants of the old Castilians. In this city there are several wealthy merchants, of different nations, who import goods largely from Europe, many of which we have mentioned already. There are also Mexican capitalists who have extensive ranchos and haciendas in the country, even one hundred miles back in the interior, and pass a part of their time in town. English and German goods seem to be most used, and generally in demand; also French brandies and wines; but few articles manufactured in the United States are shipped into any of the Mexican ports on the Pacific, although an extensive trade with New York, Philadelphia, and Boston is springing up by vessels and is landed at the ports on the eastern coast or Gulf of Mexico. On the completion of the Texas and Pacific

and other railroads connecting with the east, a large trade will be established with the large eastern cities of the United States.

The principal business houses are engaged in both a wholesale and retail trade, dividing their stores into two departments. The principal buildings are the custom-house, a new church, municipalidad or city hall, containing court-rooms, etc.; Cuartel de Artilleria or barracks for the military, a cotton factory, gas works, and the hotels "Iturbide" and "Nacional."

Some trade has been carried on with San Francisco; in fact, much more than is suspected by many of our merchants. Two iron foundries are located here that have considerable trade.

Rosario.

The town has 6,000 inhabitants and takes its name from the Rosario mines in the vicinity. These mines are some of the oldest in the republic, and have produced an immense treasure for the owners. The shafts are now full of water. The Tajo mine by its richness is a great source of wealth to the town. This town is a place of considerable importance, and at one time was the depot of merchandise of Mazatlan. The merchants resorted to it to purchase their stock of goods and dispose of produce. It was the residence of the Commissary General of the state, and others high in official authority. The streets are narrow but well paved, and the houses built principally of stone. The town is located in a ravine, and much confined. The Rosario River, a small stream, runs below the town and empties into the Pacific a few miles further below. This stream is navigable for canoes from Rosario, by which people frequently go to Mazatlan, the distance by water being shorter. This town has considerable trade with Durango and some from Guadalajara. The distance to Mazatlan is 20 leagues or 60 miles, the Presidio of Mazatlan being a kind of half-way house or posta. The place is simply a large square surrounded by merchants' houses. The distance to Mazatlan Presidio is about 30 miles. In the northern part of the state the road from Alamos in Sonora runs over a level plain when it leaves the rolling hills, and requires no repairing, as the soil is made of sandy clay, almost without a pebble, and is perfectly even and smooth. The surface is level and excellent for coaches. The distance from Alamos to Fuerte is about 35 miles.

Culiacan.

The capital of the state of Sinaloa, Culiacan, is situated on a river of the same name, in the midst of a beautiful and rich agricultural country. The population of the city is about 10,000; its streets, with a great plaza, are laid out regularly, and it possesses much inland trade. The architecture and buildings are much the same as at Mazatlan.

The state government is located here, and during the session of the legislature, it presents a more lively appearance. The distance from Mazatlan is about 155 miles, and the intervening distance between, over the route by Cosala, is rough and mountainous, with but few ranchos on the line of travel. Cotton, sugar-cane, corn, beans, and rice, and vegetables of various kinds, and fruits common to this climate and a low latitude, are grown in great abundance in the vicinity. There are also some mines in the neighborhood. Coffee is also raised in the state, and brings from 30 to 40 cents per pound. The importation of coffee has at times been forbidden, in order to develop this industry in the state.

There is a cotton factory in Culiacan, owned by Redo, who resides in the same town, and is one of the principal capitalists. A stage road runs from Alamos, in Sonora, to Mazatlan—a five days' trip—also to Culiacan, as before stated.

There is also a mint in Culiacan. The principal business houses are, Redo, Valadez, O. Salmon, Robert R. Symon & Co., and Angel Urrea. Considerable business is transacted here. The road, after leaving Alamos, which is mountainous, or a rolling region, becomes almost level as it goes south to Fuerte, and passes down the interior about 60 miles from the coast, through the same level country, to Mazatlan. It also passes down a valley in the interior, beyond the mountains east of the former road, to Culiacan, over a very level road.

The Presidio of Mazatlan is located on the road to Rosario, and was formerly the principal place of residence for the merchants and custom house officers, who removed to Mazatlan, and left it almost deserted, with the exception of a large cotton factory which is there, owned by Eche-guren & Co., of Mazatlan; and besides the operatives, the town has but few inhabitants.

The ladies of Culiacan are truly celebrated for their fair complexion, graceful forms, and modest demeanor. They

are very fond of music and dancing, and play very skillfully on the harp, and are, withal, as intelligent and captivating as any of the famous beauties of the republic. On the road to Culiacan from Fuerte are situated Sinaloa, and Mocorito, and La Muerito.

Cosala.

The town of Cosala is situated about 60 miles from Culiacan, to the south-east, and nearly 100 miles from Mazatlan. The town extends over nearly as much ground as the latter; but it is more interspersed with flower-gardens and small orchards. The town is well built; but the streets are somewhat irregular. The number of inhabitants reaches 5,000. Cosala is a mining district. Within about 20 miles of the town, is located the Guadalupe mine, which is perfectly dry, and at a good elevation from the plain.

The mines of Copala, Panucho, San Dimas, and San Ignacio are the principal ones located in the vicinity. The Saragossa mine is situated north-east from Mazatlan and north of Cosala. This mine is celebrated for its beautiful specimens of virgin silver.

In this town, a peculiar disease that is attributed to the water used exists, and is called "buche," and is known with us as goitre, or swelled neck. One traveler describes its unfortunate inhabitants as looking like pelicans.

From Cosala to foot of mountains, the distance is 15 miles due east. Santa Ana, a small rancho, and some others, are located on the road. There are some six mines near, bearing silver and magistral, and about one and a half miles from the town, the celebrated Golconda gold mine.

The principal business of the state is mining, grazing, and the raising of herds of cattle, horses, mules, sheep, etc., although the agricultural productions are considerable. The mines of the state produce a large revenue. The Xocihuistita mine, situated near Rosario, was bonded for three months at \$60,000, and the parties who had bonded it refused to renew the bond. In a short time afterward the owners sold a one-half interest for \$500,000 to American capitalists of San Francisco, who are now taking out from \$50,000 to \$60,000 per month. Some ladies at Mazatlan were the owners. Estacata is another old mine near Cosala that was once extremely rich. Tradition says that its owners were so rich and realized such fortunes from its possession that they used to lay down silver bricks for their ladies to tread

upon on their way to church, and then take them up again by their servants—a piece of extravagant gallantry somewhat unheard of, even among the descendants of the Moctezumas. Some of the mines of Mexico are worked in what we would term an extravagant manner. The shafts in some instances are walled with timbers that are placed there for their imperishable qualities, and often the wood selected is of the most valuable character, and being the nearest at hand is used with a prodigal hand. One old mine, we are told by a gentleman who explored it, to which he gave the name of the old San José mine, was literally lined with ebony. He showed us a piece of this wood which he extracted from the mine, and had made into a rough cane. The timbers were as sound almost as when they were placed in the mine, and were laid one upon the other along the walls of the shaft, and some 15 to 20 feet in length. The origin of the mine was unknown, and the mouth of the shaft had fallen in, covering it up entirely until another drift from a mine near it in search of a vein of ore was run until they came to the ebony walls of the shaft of the old mine. It was cleaned out—rubbish, etc., removed—and found to be very rich. The ebony alone would be worth a small fortune in this country. The hacienda of La Labor, owned by the Laveagas, is situated about four miles from San Ignacio and contains 40,000 acres, about one-third of which can be cultivated. Sugar-cane, wheat, corn, and other productions have been raised upon its arable lands. It is located on the San Ignacio River, and the soil is very fertile.

Mining Districts and Mines of Sinaloa.

Rosario District.—The most important mine of this district is the celebrated Tajo mine, which is the second best producing mine in the state, and is located in a rolling country on the bank of the Rosario River. The depth reached two years ago was 1,200 feet, when Mr. Geo. S. Montgomery, of this city, visited it, and we herewith give his representation of the mines of this district, and some others.

This mine produces fair milling ore, with 60 per cent. gold; the balance, silver. The vein is six feet wide, until a bonanza is reached, that widens out the vein to about 100 feet. They were then taking out ore in a bonanza that assayed, on an average, \$120 per ton, and ran sometimes in first-class ore up to \$1,000. This mine is owned by Mr.

Bradbury, of Oakland, and Mr. Kelly and other merchants of Mazatlan. This is one of the best equipped mines in the state. One stamp-mill of 30 stamps was working the ore, and since, a 20-stamp mill has been added. The 30-stamp mill was then working 40 tons per day, which, with the 20-stamp mill now, is working about 60 to 70 tons per day. This mine is supporting about 6,000 population. There are other mines in this district of minor importance. The distance to Mazatlan is about 80 miles, in a north-westerly direction.

Plomosas District.—The principal mine is the Plomosa, located in this district near the border of Durango, and is owned by a Mazatlan Company, with the controlling interest in the hands of merchants of that city. The mine is valued at \$1,200,000, and is divided into 24 shares, the usual number in Mexican mines. Mr. La Madrid was the former owner. The depth of the mine is over 800 feet; width of vein, 20 to 25 feet, well defined and apparently permanent. This mine has paid from the start, although the ore is somewhat rebellious, which could not be worked as easily as within the last year. The ores carried galena and zinc. The average assay was about \$80 to \$90 per ton, and is worked by a 20-stamp mill at the mine. This district is about 80 miles south-east from Mazatlan.

The Xocihuistita mine is located about 40 miles east of Rosario, in the district of Plomosas. A one-half interest in this mine was purchased for \$500,000 by San Francisco capitalists. The ore of this mine has assayed about 50 per cent. silver. The vein, at a depth of about 250 feet, is 40 feet wide, and contains a small percentage of gold and galena. The mine has been worked for some years by Mexicans. The superintendent of the Guadalupe de Los Reyes negotiated the sale of this mine, being the principal owner. They have worked the mine by a 10-stamp mill; but are now erecting a 20-stamp mill, and are by the old stamp mill producing from \$50,000 to \$60,000 per month. The ore is rebellious, and is consequently more expensive to work than the ores of many other mines in the state; but the large percentage of silver makes it a very profitable mine. The distance from this mine to Mazatlan is about 80 miles.

The Santa Maria mine is also located in this district and is reputed to be a very good mine.

The Panucho District.—The Santa Rosa mine is the principal mine, and was abandoned for some time until it was lately opened again, when a bonanza was reached within

the last few days that the "El Minero Mexicano"—the official mining paper—says is yielding richly. The ores have been rebellious and the vein small, hitherto.

Copala District.—This district is located about 60 miles north-east from Mazatlan, near the border line of Durango. The mines of this district are mostly controlled by foreigners. The principal mines are the Cuarto de Señores and the Cinco de Señores—besides the Cinco de Mayo and Siempre Viva.

The Cuarto de Señores was first owned and developed by Mr. Wm. Best, of Best and Belcher fame. It is now owned and worked by merchants, the principal of which are Messrs. Kelly & Co. The depth of this mine has reached 700 feet. The vein widens out from 20 to 30 feet in thickness to 100 feet—inclination, almost perpendicular. The rich ore is found in pockets, and is broken off at irregular distances by "caballos," which separate the vein, or divide it into sections. On passing through the caballo, the ore is found invariably to be bonanzas, which assay from \$300 to \$500 per ton. At the depth of 700 feet, six bonanzas have been reached. The mine was opened near the summit of the mountain, on the side, about 400 feet from the creek or arroyo Copala. Since reaching the water level, much water has been coming in, and the pumps are kept in constant motion. A 10-stamp mill reduces the ore at the mine.

The Cinco de Señores mine is located near the Cuarto, which has reached a depth of 400 feet; width of vein, three to six feet; and is well defined, and ore more continuous, without pockets. The ore is quartz, carrying antimony and zinc in the whole district; consequently the ores are rebellious, but carry 40 per cent. gold and balance silver. The average assay is somewhat over \$100, reaching to \$120 per ton. This mine is owned by two merchants in Cosala and three in Mazatlan.

The Zaragossa District.—The principal mine of this district is the "Zaragossa," and is very celebrated for its beautiful specimens of native silver, which are found in small bonanzas in a narrow vein. This mine is principally owned by Mexicans, who extract the ore with chisels and the "barraton."

The San Ignacio District is located on the San Ignacio River, and its mines are scattering. The principal mine is owned by Mr. Kelly, who ships a large part of the ore of best class to England. The depth of the mines worked is about 500 feet; width of vein, from two to six feet. The

best ore reaches as high as \$700 per ton or thereabouts. The average reaches about \$200. The ore is sorted into first or best class and second class; the latter is reduced at the mine. There are a number of mines in this district worked by Mexicans, some of which are reported to be rich.

Cosala District.—This is the largest district in the state, and some of the mines are celebrated for their rich ores, among which may be mentioned the Guadalupe de los Reyes group, the principal of which is sometimes called the Estacata mine.

The group of mines called the Guadalupe de Los Reyes contains the Estacata mine, and is located on the side of a mountain in the Sierra Madre range, about midway or 400 feet above the creek. The depth attained in this mine is 1,200 feet; width of vein, 30 varas. The vein on the surface was only three inches in thickness. This gradually widened and was clearly defined, until an ore body was reached at a depth of 400 feet, which proved to be a bonanza. The vein was rich from the surface, bearing 60 per cent. gold and 40 per cent. silver. The assay of the bonanza ore was less than the vein before the ore-body was reached, as the former sometimes reached \$600 or \$700 per ton, while the latter only reached \$200 per ton; the gold and silver being finely disseminated through the ore body. The first ore body, judging from the development of the mine, was from 40 to 50 feet wide, and extended down for about 300 feet, when it became narrower, and tapered into the original width of the vein. From this point, the vein was again followed for over 100 feet, when another ore body was found larger than the first. The second ore body proved to be 30 varas wide, of continuous ore, and a veritable bonanza, with an average assay of \$250 per ton, in some instances reaching \$2,000 per ton. The work is now progressing in this vein, which was reached over 18 months ago. The principal owners are Echeguren & Co., of Mazatlan. It is said that this mine has produced \$18,000,000, by the records at Cosala. Two stamp mills, one 20 and the other 10, reduce the ore at the mine.

The mines of this district, called the Bufa, Mammoth, La Estrella, Realito, and the Mina del Agua, are owned by a San Francisco company, called the Mexican Mining and Real Estate Company, of Cosala, of Sinaloa, of which Mr. Geo. S. Montgomery was the superintendent for two years. This is the second largest company in the district, and the

mines owned by this company are all old mines, formerly worked by Mexicans for the last 150 years.

We are indebted to Mr. Montgomery, the superintendent, for the following description of their mines—he being a stockholder of the company—as follows:

“The Estrella and the Bufo are the two principal mines, and have reached a depth of about 500 feet. The ore body of the Estrella is 28 varas in width, extending over 40 feet in length. The vein dips at an angle of 45 degrees. All the way down, the vein has averaged the same width, and is one of the largest in the district. The average assay is about \$175 per ton, running all the way from \$50 to \$400. The mines are dry, being located above the Sierra Creek, 900 feet, on the side of a mountain.

“The Realito is developed by a long tunnel, running into the side of the mountain, about 500 feet above the bottom of the ravine, tapping the vein, which is about three feet wide, and is well defined. The assay reaches from \$180 to \$500 per ton. This mine is about one-quarter of a mile distant from the other two before mentioned.

“The Mammoth is called a promontory, and opens into a large body of quartz, striking the center, apparently, of a massive lode. No walls of any other formation have been found as far as developed—a very singular formation—and Mr. Montgomery terms it a mountain of silver-bearing quartz. This mine has been worked by Mexicans for over 150 years. The shaft, or rather walls, of the chamber opened are 120 feet apart, and the depth reaches 200 feet from the surface—an immense cellar, with silver-bearing quartz on all sides. It is estimated that this lode extends from the center, as far as has been ascertained, 200 feet on each side, or 400 feet in diameter. The average assay is about \$80 per ton, reaching, in some instances, \$140. The ore is more even, and without pockets, with gold and silver disseminated finely through it.

“Besides these mines owned by the last-mentioned company, they have purchased twelve square miles of land surrounding their hacienda or reduction works, which consist of a 15-stamp mill, and another of 20 stamps, in course of construction. The same company have also purchased a controlling interest in 100 square miles adjoining, both of which tracts were purchased from Mexican citizens.

“**The Rosario Mine** is located about three miles south-west from Cosala, and possesses a vein about from five to seven feet wide, and is clearly defined. The depth attained is 300

feet. The assay reaches an average, we are told, from \$160 to \$180 per ton. The upper levels or drifts are only worked, the lower ones being full of water."

Cosala.—This district contains mostly rebellious silver ores in all the mines, with the single exception of the *Guadalupe de los Reyes Mine*, which latter is the only one containing free milling ores.

The Golconda Gold Mine, is a celebrated mine, and a phenomenon. It is located within one-and-a-half miles of the town of Cosala, in a north-westerly direction. The lowest shaft is not over 120 feet in depth. The formation of the rock on this lode is of the same nature and character as the Black Hills, viz., a rotten quartz formation, carrying free gold, finely disseminated all through the ores, and is consequently easily reduced by mill and the usual amalgamating process. The ore contains only free gold, with no traces of silver. It is estimated that 200 stamps would not work in fifty years, the amount of ore in sight. This celebrated mine, which appears to be inexhaustible, is located in a low range of hills, bordering a spur of the Sierra Madre Mountains, about one-and-a-half miles beyond or north-west of Cosala town, with a natural grade reaching it. The ore of this mine lays in an immense lode, extending from the surface down as far as the mine has been developed. The depth of the shafts are 70, 80, and 120 feet, some three or four of which have been sunk at a distance of from 300 to 400, and 500 feet apart. The extent of possession is 1,200 varas, or about 3,300 feet. Each of the shafts have struck the same lode, developing the same ore. This mine is similar to the famous Mulatos Mine in Sonora, in many particulars.

The Golconda gold mine of the Cosala district has already been noticed, and having received later information that may be of interest, we give the same as follows: Mr. Henry S. McKee, who is now working in the mine, reports that one of the shafts at 120 feet has struck ore that assays in gold over \$300 per ton. The body of ore in sight is thirty feet thick without reaching the walls. The character of the ore is free gold quartz with no streaks or pockets, but the metal is finely disseminated through it. The ore is easy of reduction and is worked by the usual process. This mine has a history that reaches back over 150 years. It has been worked almost continuously during all this period, except when interfered with by local disturbances or revolutions. The mine was once purchased by a foreigner who bought it

of a Mexican for \$80,000, Mr. Harpending of San Francisco being the purchaser. He sent an expert from this city—a brother of Mr. Smith, of the firm of Pendergast & Smith, of the *Ætna Foundry*, who examined the mine, and reported, after experimenting with 200 “cargas,” that the mine was a very profitable investment, and, indeed, would warrant the erection of extensive reduction works on account of its apparent richness. Mr. Harpending would have done so, had he not become financially embarrassed, so much so that the enterprise was abandoned, and all the money invested, notwithstanding the report of the expert. The present owners of this mine intend to continue its development, but are somewhat crippled for the lack of capital sufficient to work the mine on a large scale. They are now working it by the *arastra* and usual amalgamating process. The ores have been extracted in large bodies in each shaft, and seem to be inexhaustible.

The mine is located in what is called a promontory or huge mass of quartz, that seems to be a ledge of paying ore throughout the whole extent of possession. The lowest assay of the ore selected at random from either of the shafts never falls below \$20 per ton, and from that reaches up to \$300 per ton. There is, apparently, no defined vein, as the walls have not been reached on either side, the whole mass of quartz presenting the face of the vein as far as worked; consequently, huge holes have apparently been sunk into the center of the vein about 20 feet wide, extending the whole depth of the shafts.

We are told that the outcroppings of this mine assay anywhere never below \$20 per ton. The soil, even, overlaying the ledge, has been panned for some years, and continually gives the color in each pan, often paying well. The ore was formerly worked by crushing the rock in the *arastras* and then panning the result without amalgamating.

This mine has in the vicinity, timber and water in abundance, and sufficient water to run a mill by water-power all the year round. The mine is located on a slope inclining toward the stream, or *Cosala River*, which empties into *Eloa River*. In a distance of 100 yards the fall is about 12 feet, and by running a ditch about 500 yards, will give a fall of at least 20 feet. The site of erection for the mill is located about one mile from the mine, farther down the slope, and within one-half mile of the center of the town of *Cosala*. Extensive reduction works might be here erected, to be run by water power or steam; and with a 40-stamp mill, cal-

culating its reduction power to be at least two tons for each stamp, 80 tons per day might be reduced, averaging, at least, \$30 per ton, would produce daily about \$2,400, or at least, \$70,000 per month. This is a very liberal estimate, from the fact, that the ore has been known to produce on an average, at least, from \$50 to \$80 per ton, which would amount to \$6,000 per day, or \$180,000 per month, or about \$2,600,000 per annum. The cost of working the mine would not amount to more than \$3 per ton, at the farthest, which would leave an enormous profit.

The Nuestra Señores mine is located north-east of Cosala, on the Elota River, near the source, and almost on the boundary line, and is owned by Mauricio La Madrid, and is about 20 miles from Cosala. This mine contains two classes of ore; one being lead and silver, while the other is free milling silver ore. The depth attained is about 200 feet. The lead-bearing ore assays about \$80 per ton, and the free-milling ore nearly \$120, on an average. This mine is reported to have reached a "bonanza" that assays as high as \$1,000 per ton. An attempt was lately made to purchase this mine for \$500,000, an expert having been sent to examine the property, who reported very favorably upon it. A small, four-stamp prospecting mill, for the purpose of prospecting the mine, has been reducing the ore, and the result is said to have been very satisfactory. This is an old mine, and very celebrated; and Mr. Ward tells us that its former owner, Don Francisco Iriarte, at one time (in 1825) refused an offer of \$1,000,000 for the privilege of working this mine for three years, by a foreign association. The mine is free from water, and situated at a considerable elevation above the plain. It contains a vein of gold of considerable breadth, and its former reputation was fabulous.

Barreteras Mine.—This mine is celebrated. The town of Cosala was built up by it, and a church founded upon its productions. The mine has produced many bonanzas, yielding rich results. The character of the ore is native silver. The mine is developed by a shaft of 500 feet in depth, and by a tunnel over 1100 feet in length, from the side of the mountain into the heart of the vein. The mine is located at the summit of the mountain, in the Sierra Madre, distant from Cosala about six miles west. The view is grand from this point, extending over a hundred miles, as far as the eye can reach, over mountain-tops. The vein is about two feet in ore deposits. It reaches only six or eight inches with seams of native silver, that are extracted by the

barraton, or a chisel. The pockets reach, sometimes, 20 or 30 feet along the vein at irregular distances. The mine is owned and worked by Mexicans. The character of the rock surrounding the vein is a granite formation, easily worked. The ore is smelted by furnaces. The ore is almost virgin silver, as at Batopilas. The lower levels are filled with water.

At one extremity of the district of Cosala is found a great number of gold and silver bearing quartz mines that are said to be very rich. The ore carrying gold is mostly free milling, and the mines have yielded very largely in the past. They have been worked extensively by natives and Spaniards; but on reaching water, could not go any farther, in the absence of machinery, and the mines were consequently abandoned, after a large expenditure of capital upon them. Another cause of abandonment was continual revolutions, or organized robbery, that forced the owners to pay a tribute on their wealth, and at last drove them away; and either fearing to return, or finding lucrative employment and mines elsewhere, the mines, consequently, became entirely abandoned and filled with water.

There are many of these old mines closely grouped together that are not adjacent to any settlements, but in the midst of one of the wildest regions of the mountains, that is hardly ever entered, save in the search for lost cattle. A good wagon-road may be constructed from these mines to the river, and reach a railroad that is to be built, passing within 15 miles of the mines. Wood is abundant, and water sufficient to run an ordinary mill the year round.

There are quite a number of extensive veins of rich gold and silver bearing ores in this region that have yielded largely wherever they have been worked, within a radius of 12 miles, and all contain ores easy of reduction.

To the east of this locality is located another rich mineral region, called Vetillas, from the large number of rich veins that have been found in the neighborhood. The ores are more uneven and rebellious; but the location is good, with a perpetual stream passing through the district and adjacent to the location of the mines. The mountains are of high elevation, with hard-wood trees covering their sides that would be valuable for timbering the mines, etc. Here are located furnaces for smelting the ores, which were abandoned with the mines by the former owners.

The celebrated Guadalupe de Los Reyes mine is located within about 24 miles of these antiquated haciendas, north-

east, and other mines that are being worked with good results. This is an old mining region, that was worked by Spaniards under the Spanish regime; but the owners were obliged to flee in the war for independence. The ruins of ancient *arastras* and furnaces are numerous, and prove the locality to have been extensively worked. These mines have not been worked for about 70 years. The old mill-site could be restored, and the mines reopened, providing an expert should deem the enterprise profitable. The *arastras* were run by water power, and the veins opened as close as possible to the stream, which naturally filled the shafts with water. One of these old mines was called *Mina de Plata*. The residents nearest to these mines report that they were very rich, and contained *bonanzas*.

The adjacent river bottoms are planted with orange, lime, and plantain trees in different places, with other tropical fruits.

A wagon-road can be constructed from this point to Mazatlán, at a small cost, passing through or near large ranchos that are cultivated extensively, producing corn, beans, sugarcane, and other productions. This region is located north from Mazatlan, distant about 70 miles.

The Palmarajo is another old district; also, the ancient mining district situated in the northern part of the State near the boundary line of Sonora, called the De Chois and Ycora districts, that were, at one time, extensively worked, and contains some good mines; also, the celebrated ancient mining district of San José de Gracias, which is located in the midst of an almost inaccessible mountainous region, in the northern part of the State. Since their abandonment years ago, they have scarcely been worked but by *gambucinos*. This region formerly had a fabulous reputation.

CHIHUAHUA.

CHAPTER I.

General Description.

The State of Chihuahua is bounded on the west and south by Sonora, west by Sinaloa, on the north by New Mexico and Texas, and on the north-east by Texas along the Rio Grande, and on the south by Sinaloa and Durango, and on the east by Coahuila. The area of the State extends over 100,000 square miles, with a sparse population of about 190,000.

The state is divided into 18 cantons or departments, as follows: Iturbide, Aldama, Abasolo, Victorio, Rosales, Meoqui, Morelos, Bravos, Hidalgo, Allende, Camargo, Balleza, Jimenez, Guerrero, Galeana, Rayon, Matamoras, and Artega.

The great plateau west of the Rio Grande region consists of undulating prairies, with here and there a conical shaped hill, and extends to the Sierra Madre mountains on the west and south-west. There are some depressions in the plains which, if opened, would supply water. Then we have the large body of water south-west of El Paso, known as Lake Guzman, and the River Mimbres. This river rises in the Rocky Mountains, in New Mexico, and, after coursing through the plateau, discharges itself when full into Lake Guzman. It seldom reaches the lake, however, its waters being absorbed or lost in the sandy plains. Its sources have never been traced out, as far as known. It must flow about 130 miles, when full.

Lake Guzman, during the wet season, is about 30 miles long and from five to six miles wide, and seldom dries out entirely, although it is almost surrounded by sterile tracts of land covered with sand plains and alkali, interspersed with sand-hills. It is located about 60 miles south-west of El Paso, more in a westerly direction. These sand plains extend the most of this distance, after leaving the Rio Grande region, until the neighboring lands of the lake are reached.

The whole water system of the state embraces, besides Lake Guzman, four other small lakes or pools, called Maria, Candelaria, St. Martin, and Patos, and are all located north of the central part of the state, in depressions of the table lands, with the exception of lakes St. Martin and Candelaria, nearer the center and south and south-west of the sand plains. In the mountain ranges and spurs of the Sierra which are cut with deep gorges and cañons, and which are located in the western, south-western and southern part of the state, there are many mines of the precious and useful metals, containing gold, silver, copper, lead, iron, tin, saltpeter, bituminous coal, and cinnabar. This region is also noted for forest trees of great value which cover the mountain sides, especially near the water-courses and between the ranges. The Sierra Madre range extends along the western boundary of the state, and is almost impassable except at the northern and western, south-western, and southern, part of the state, through the cañons of these localities. The Mulatos River, sometimes called the Papigochi, which is a branch of the Yaqui River in Sonora, rises in the Sierra Madre, south-west of Chihuahua City, and flows north-west through a pass in the mountains east of, and near Aribechi in Sonora. The tributaries from the neighboring valleys flow into this stream (Mulatos) near the pass. The river Buenaventura also rises in the Sierra Madre and flows north of the Presidio of Buenaventura into the small lake or pool of St. Maria, while another small stream loses its waters in the table lands near the Presidio de Janos, which is connected with a road to Bapiste in Sonora on the west, about 40 miles distant. The river Carmen rises west of lake St. Martin and empties into lake Patos in a northerly direction. South-east of lake Patos is located another extensive sand and alkali plain on the table lands that reaches to the hills bordering on the valley of the Rio Grande and the river Conchos, over a territory of about 120 miles long and 40 wide. The latter river has many tributaries taking their rise in the mountains south of the central part of the state, and flows by Santa Rosalia, San Pablo, and other towns in a northerly course, with many windings, into the Rio Grande at the Presidio del Norte, and is about 300 miles long. East and south-east of the river Conchos and south of the Rio Grande extends the vast desert called "Bolson de Mapimi," which embraces all the extreme eastern part of the state south of the Rio Grande and also a portion of the state of Coahuila on the east. In this plain are dried-up lakes, and the whole is completely

covered up with a vast tract of sand and alkali plains which are sterile and completely deserted, and entirely destitute of water. Near the rugged sierras are mesquite-covered plains, but beyond them lies the vast desert of Bolson de Mapimi, extending over 250 miles from north to south and 100 miles in width, through which no traveler ever passes, as the road to Durango and Mexico lies to the south-west. Thus it will be seen that a large portion of Chihuahua is absorbed on the east by the desert lands, and north-east and the south-west by mountains and broken regions, the latter taking up about one-third of the state, and the former, or about one-fourth, is desert wilds. The balance of the region on the Mexican side of the Rio Grande to the Gulf of Mexico is mountainous through Coahuila, New Leon, and Tamaulipas, bordering on table lands that are intersected with rivers flowing through small valleys into the Rio Grande, and is very sparsely settled until the slope toward the gulf is reached.

On the Rio Grande is located Laredo in the state of Tamaulipas, which has assumed some importance on account of the Mexican Central terminating at that point, passing through Monterey, New Leon, and other cities on the direct route to Mexico City.

Mr. Ruxton says that "the State of Chihuahua produces gold, silver, copper, iron, saltpetre, and other minerals; but it is productive of mineral wealth alone, for the soil is thin and poor, and there is everywhere a scarcity of water; but it is a paradise for sportsmen. In the sierras and mountains are found the black and grizzly bear of the Rocky Mountains, the latter of which is very abundant in the neighborhood of Chihuahua. The big horn, or Rocky Mountain sheep, and black-tailed deer, the 'cola prieta,' (a large species of fallow deer) a species of pheasant and quail in abundance, and birds of brilliant plumage are found. Among the reptiles are the rattlesnake and copper-head, and scorpion, the latter of which is found all over the republic. The characteristic shrub of the elevated plains of Chihuahua is the mesquite, a species of acacia, which grows to the height of 10 to 12 feet. The seeds contained in a small pod are used by the Apaches to make a kind of bread or cake, which is sweet or succulent to the taste. The wood is extremely hard and heavy.

"In Durango and Chihuahua, the ranchos are supplied with such simple goods as they require by small traders, resident in the capitals of those states, who trade from one village to

another, with two or three wagons, which, when their goods are sold, they freight with supplies for the cities or mines."

There are about 200 villages and towns in the state, the principal ones being Chihuahua and El Paso del Norte. The former is the capital, and is located south of the central portion of the state, about 230 miles from El Paso del Norte and El Paso Texas on the Rio Grande.

Soil, Productions, and Grazing.

The soil is fertile, especially on the water courses between the mountain ranges and along the Rio Grande. Outside of mining, grazing forms the principal pursuit; though the vine, wheat, corn, peas, beans, barley, cotton, and sugar-cane, are cultivated to some extent. This is a great grazing state, abounding in stock, which are disposed of in Texas and Kentucky. Good grazing is found on the table lands in many places, where immense herds of stock of all kinds are raised: although along the water-courses the best grazing is found. Along the Las Casas Grandes, and Conchas, and other streams, which almost entirely disappear in the sands during the dry season, immense herds of stock are raised. In the neighborhood of Chihuahua, about 170 to 180 miles south-east of Lake Guzman, are located extensive ranchos. One of these is owned by Don Encinallas. This rancho has about 300,000 head of cattle, sheep, horses and mules, on its grazing lands. Some agricultural productions are also raised in the state on the banks of the streams which are used to irrigate the lands.

The mines of the State constitute almost its sole feature of importance, outside of the grazing or raising of stock on the fertile table lands and banks of the water-courses. The climate of Chihuahua is varied; cold in the winter, and in the mountainous districts it reaches the freezing point; and snow falls about two feet deep. In the valleys the temperature varies from the cool and pleasant in winter to heat in the extreme. The climate of the state on the whole can be said to be much cooler than either that of Sonora or Sinaloa.

CHAPTER II.

Chihuahua.

The city of Chihuahua is the capital of the State, and is located west of the Conchos River near the center of the state, and is distant from Mexico, in a direct line, about 1,250 miles; from El Paso, in a south-west direction, about 230 miles; and from Guaymas, by way of Baleza, in Chihuahua, and Alamos, in Sonora, 500 miles. It is reached by a stage or wagon road from El Paso, on the north, and Laredo on the Rio Grande, on the east in Tamaulipas—the projected terminus of the Mexican Central R. R.—by way of Durango; and Mexico on the south-east, by way of Durango, a direct line of communication being opened to all of these points. From Alamos, through Batopilas, it is about 230 miles.

The road through to Alamos has not yet been put into complete condition for wagons; hence, the most of the travel in that direction is on the back of mules. The city of Chihuahua was built toward the close of the seventeenth century, although the State was originally inhabited and occupied at Las Casas Grandes by the Aztecs many centuries ago. No one knows the date, farther than by the records of the ancients, which say that the state was occupied by the Aztecs at that place in 1160, or over seven centuries ago.

The city of Chihuahua is well laid out, with the streets crossing each other at right angles. They are broad, well paved, and kept quite clean. The square called the Plaza Mayor is quite extensive, and ornamented on one side by the famous cathedral, which has been pronounced by American traders to be one of the finest structures in the world. This building cost \$800,000, and is constructed of brown stone masonry. It is surmounted with a dome and two towers, and is in imitation of the modern Gothic, mingled with the Moorish style of architecture. It is a large building, having a handsome façade embellished with statues of the Twelve Apostles.

On the other side of the Plaza, there are public and private buildings, including the ancient State House.

The unfinished Convent of San Francisco also looms up from the other buildings, a “conspicuous mass of masonry and bad taste,” says Mr. Ruxton. In the center of the plaza, which is adorned with flowers and orange and other trop-

ical trees and shrubs, a beautiful fountain plays day and night, which is supplied with water continually by a well-constructed aqueduct a little over three miles long, which carries water from a tributary of the Conchos River or stream. This aqueduct supplies the town with water, and is supported on several stupendous arcades, which adds much to the massive architecture in the town.

The large cathedral was built out of the proceeds from one mine in the vicinity, which struck a bonanza that continued for nine years, and was apparently inexhaustible. One real was laid aside for each marc of silver produced, and a fund was formed, out of which this magnificent cathedral of Chihuahua was built, and a reserve fund formed of \$100,000. A mint is also located here. Much trade is carried on between this city and San Antonio, Texas, and St. Louis, and Santa Fé. It is also the resort of many strangers from New Mexico, California, Texas, Sonora, and Sinaloa. The city contains about 18,000 inhabitants. The Jesuit Convent of San Francisco before mentioned is celebrated as having been the place of confinement of the patriot Hidalgo, the Mexican Hampden, who was executed in a yard behind the building, in 1811. A monument has been erected to his memory in the Plaza de Armas, and is a pyramid of stone, with an inscription eulogistic of his character and patriotic record.

The shops are filled with goods from the various points before mentioned, and it is not unusual to find the finest of imported silks, and other costly articles from Europe and India. Traders arriving in Chihuahua either sell their goods in bulk to resident merchants, or open out a store on their own account. The goods are brought across the border from the United States in wagons; and some years ago, a law was passed by the state, charging a duty of \$500 for each wagon-load, without taking into account the value or nature of the articles. The result was, that one wagon was made to carry three loads, to evade the duty on two loads. This has been abolished since, we understand, and the laws relating to duties are general throughout the republic. The city of Chihuahua supplies all the surrounding country.

Las Casas Grandes and its Legend.

The famous Las Casas Grandes, or Great Houses, are located towards the north-western part of the state, on the west bank of the Las Casas Grandes River, which flows into

Rio los Conchos. Here lie, decomposing and moldering under the luxuriance of vegetable growth, the ruins of Aztec greatness.

A legend is related by Spanish historians of the migration of the Aztecs to Chihuahua and Arizona, where a portion also located and built the Casas Grandes, ruins of which are now seen in that territory. The legend is found in the work of Antonio Garcia Cubas, and in the works of many other Spanish writers, and is as follows:

"Huitziton, a person of great authority among the Aztecs, heard in the branches of a tree the trilling of a small bird, which in its song repeated the sound 'tihuc,' the literal meaning of which is, 'let us go.' Huitziton being struck at this, and communicating his impressions to another personage, called Tecpaltzin, they both induced the Aztecs to leave their country, interpreting the song as a mandate from divinity. Even to the present day, there is a bird known among the Mexicans by the name of 'Tihuitochan' (Let us go home).

"In 1160 they commenced their peregrination, and passing by a large river in which historians concur in being the Colorado and which discharges itself into the Gulf of California, they advanced toward the river Gila, after remaining for some time at a place known to-day by the name of Casa Grande, not far from the shores of that river. From thence they continued their road and again took up quarters at a place to the north-west of Chihuahua, now called like the previous stopping place, Las Casas Grandes, and whose ruins show the vast proportions of the ancient building and fortress. Leaving behind them the wide "Sierra de la Tarahumara," they afterward went to Hueycolhuacan, now Culiacan, capital of the state of Sinaloa, and there remained for three years, during which time they made the statue of their god Huitzilopochtli, which was to accompany them in their expedition.

"During their peregrination the tribe was divided into two factions, one faction settling on a sandy promontory called Tlaltelolco. The name of Mexico was given to the new city, in honor of their god who was born of a virgin belonging to the family of Citli, and he was cradled in the heart of a maguey plant (or metl); hence the name 'Mecitli,' afterward changed into 'Mexico.' The popular drink of the Mexican people is made from this same plant, and is called 'mescal,' a strong intoxicating liquor."

From the appearance of the Las Casas Grandes or the

great houses, it would seem that their outer proportions were the lowest, and not above one story high; while the central ones were from three to six stories high. The ruins are constructed of adobe, though these are much larger than those in use among the Mexicans at the present day. From a report touching a close examination of Las Casas Grandes, it is to be inferred that they occupied a space of at least 800 feet from north to south, and from east to west near 250. On the south side a regular and continuous wall or fortification may be traced, while the eastern and western fronts are extremely irregular, leaving projecting walls. Within the inclosure there appear to have been several court-yards of greater or less dimensions. Las Casas Grandes here resemble those near the Pimo villages on the Gila in Arizona. The town near, of the same name, has about 1,500 inhabitants.

CHAPTER III.

RIO GRANDE REGION.

Near El Paso del Norte there is a good agricultural country. This town is located in the extreme north-western portion of the state on the Rio Grande. The products of this region are grapes, fruit, wheat, Indian corn, and other cereals. The bottom lands along the Rio Grande are extremely rich, and extend back from the river about one mile; beyond this rolling hills into the table-lands, which continue until broken by the valleys of the four lakes and their streams before mentioned. About 70 or 80 miles from El Paso del Norte, in the interior, in a southern direction, the land is sterile, as before mentioned. Then as the country nears Baranca, a small town situated east of Las Casas Grandes, the country grows better, and the soil extremely rich, in places. South of these sand plains there is a good grazing country. There is no water to be found near these sand plains, and water has to be carried in crossing them. The Rio Grande region extends along the Rio Grande the whole extent of the north-western boundary, and small towns are occasionally met with on the road, among which may be mentioned El Presidio del Norte, and San Vicente. Much stock is raised all along this region, and some agricultural productions.

El Paso del Norte.

This town was named from the ford on the river and the pass between the mountains, and literally means the "passage of the north." This is the oldest settlement in the northern part of Mexico. A mission was established here by El Padre Fray Augustin Ruiz, one of the Franciscan monks, about 1585. The colony was composed of twelve families from Old Castile, under the leadership of Don Juan Oñate. Several years after the first settlement the Spanish colonists of New Mexico were driven to this settlement, where they erected a fortification and maintained themselves until the arrival of reinforcements from Mexico. The population of the place has not increased much since the year 1848, as there were then 5,000 to 6,000 inhabitants—about the same number as now. The colony divided the lands bordering the banks of the river, into small plats of twenty acres each, and gave one to each family, on which they raised corn, potatoes, beans, and vegetables, and planted small vineyards and fruit trees; and the river was dammed up in dry seasons, about a mile above the ford, and water conveyed by an aqueduct or main canal to irrigate the bottom lands. The whole settlement was intersected in every direction with dikes. They manufactured the grapes into wine and brandy, or "aguadiente," the latter of which is much esteemed in Chihuahua and Durango. Under proper management, wine-making here might become a very profitable branch of industry, for the soil is especially adapted for the vine, and the interior is supplied with French wines at an enormous price. Wine may be made of the El Paso grape, equal to the best growth of France or Spain. The river bottom is timbered with cottonwoods, where it is not cultivated for a few hundred yards on each side of the stream.

The town of El Paso del Norte is located opposite the town of El Paso, Texas, on the American side, and runs down the river about three miles, and back one mile. The region is thickly settled for several miles farther down, and back five miles from the river. There are a number of vineyards in a high state of cultivation. The town has two or three principal streets, on which most of the business is transacted. The streets are narrow, irregular and dusty. The houses are built of adobe, and the windows are barred with iron gratings. The doors are fastened with wooden bars inside, and are clumsy affairs. Carts with large wheels, hewn from logs, are still used here—the same clumsy and heavy vehicles so often seen in Mexico.

This town, although presenting a somewhat unsightly appearance to the visitor, is destined to be one of great importance, and will soon serve as the distributing point for the whole of north-western Mexico, including Sonora, Chihuahua, Sinaloa, and Durango, on the completion of the railroads centering here.

The Rio Grande River is a shallow, muddy, sluggish stream, and not over two or three feet deep at this point, during the dry season, but assumes large proportions in the wet season. The banks are low and sandy, and the course of the stream often changes, and, for this reason, the towns on its banks are mostly situated high up on its banks and on the neighboring plateaus or bluffs. The water in the river is very good for drinking and cooking purposes, and not so impregnated with alkali as the well water in use by the inhabitants.

The river, at this point, is small, but in the time of the rainy season it swells to six times its width in the dry season. It is fordable in almost any part, but from the shifting bars and quicksands, the passage is always difficult for loaded wagons, and often very dangerous. The stream abounds in large fish of an excellent flavor, and large eels. During the rainy season the ford is crossed by a ferry-boat. The settlements extend down the river some distance, in little groups or towns, for some 15 miles, and are mostly inhabited by Mexicans, with here and there some few exceptions. Some enterprising Americans having planted vineyards, are carrying on a very good trade in wine and brandy with the interior.

Mining Districts and Mines of Chihuahua.

The principal mining districts of Chihuahua are, the Guadalupe y Calvo, Zapuri, Batopilas, Urique, Guazaparez, Jesus Maria, and Potrero, Morellos, Chinapa, Pinos Altos, Concepcion, Cusihurriachic, Magurichic, Hidalgo y Tenorio, San Francisco del Oro, and Hidalgo del Parral.

The Guadalupe y Calvo mines, which are located in the southern part of the state, are mostly owned by a New York company, who purchased them from an English company, who obtained vast profits from working them. The mines of this district obtained their great reputation from the immense wealth brought to their English owners. The Zapuri District is also very rich, and is owned by Becerra Hermanos. The mines of this district, which are now being

worked, are said to be the richest in the state of Chihuahua. The Batopilas District is mostly owned by several American companies and individuals, and is located in the south-western part of the state, about 90 miles from Fuerte, in a north-east direction.

The celebrated San Miguel mine is owned by the Batopilas Consolidated Mining Company, of New York, with other mines in this district. Mr. Shepard, of Washington City, owns the controlling interest of this company, which is amassing immense profits from their mines.

The San Miguel, which is now yielding from \$7,000 to \$8,000 per day, is located near this point; and while working the mine, they reached one of three veins that produced bonanzas of from 50 to 90 per cent. pure silver; the rich places being found sometimes in one ledge, then in another.

The Santo Domingo, which is located on one side of the San Miguel, and is owned by Mr. Kirk, of Philadelphia, struck a bonanza upon the same ledge that was passed through by the San Miguel, without finding rich ore, though the latter mine struck a bonanza on the next vein beyond.

The Nevada Tunnel Company's mine, owned by Becerra Hermanos & Co., was opened near the converging point of the different veins, expecting to strike it rich on the other side, to the right of the San Miguel mine; they reasoning that if the veins all converge at this point, which the angles of the ledges or veins indicate, they will find one solid bonanza of all the veins in one. If this is true, the result will be millions to the owners. These mines are all located in the Batopilas district, the veins of which produce virgin silver, with little or no alloy with copper or base metals. We were shown specimens of ore taken from these mines, and found them to be from 50 to 90 per cent of virgin silver. These specimens are to be seen at Mr. J. F. Schleiden's office, of this city, who very kindly gave us valuable information in relation to the mines of Sinaloa, Chihuahua, and Durango.

The Urique District contains many rich mines, and is owned by the Becerra Hermanos.

The Chinipas District is on the road to the Guazaparez district, and possesses some very good mines. The latter district contains some rich mines, and is entirely owned by Mexicans.

The Jesus Maria District may be mentioned next, to which we have given special attention in the reports of

assayers and mining experts; the greater part of which information is found in the valuable book of Mr. Mowry, on Arizona and Sonora. The mines of this district are all owned by Mexicans, and are now worked to great advantage.

The Pinos Altos District is mostly owned by English and American companies.

The district of Morelos is also, with the Pinos Altos, very rich in ores that yield marvelously.

We might add that the Batopilas district is completely surrounded with mountains containing milling ores. The silver is almost entirely native in this whole region. The celebrated Tajos mine is located in the Batopilas district, and is famous for its beautiful specimens of ores. This mine is also owned by the Bacerra Hermanos. There is another silver mine in Parral, that has a shaft 300 feet deep, that pays \$175 per ton, according to the assay of Salazar, assayer, of Tucson, Arizona. This mine is located in the southern part of Chihuahua, in the Sierra Madre range, in the vicinity of other silver mines. The vein, Mr. C. Orcilla, the owner, who is now in this city, says, is from 12 to 24 feet wide, and is located in the town of Parral, that has 6,000 inhabitants. The river, or Parral Creek, runs through the town. There is good grazing in the vicinity, and it is surrounded by cattle ranchos. It is in a region well settled. The mine is an old one, and the extent of possession is 600 by 200 varas. The ore is milled near the same place by the primitive *arastra*. The ore is carried to the *aras* on the backs of mules. The mine is for sale, and can be purchased of Mr. Orcilla. The *El Minero Mexicano*, of December 9th, says that the mines of Hidalgo del Parral might be explored by the expenditure of \$500,000.

Mines of Jesus Maria and San Jose Districts.

"The Nuestra Señora del Rayo mine, in the district of Jesus Maria, was discovered shortly after the discovery of the mine of Jesus Maria, from which the mining town derived its name, in the year 1823, and is situated in the western range of mountains of the creek of Jesus Maria, at one-and-a-half miles from the town.

"The Rayo was discovered at the same time as the celebrated Santa Juliana Mine, from which it is about 500 varas distant. Its first owners were Messrs. Tomas Suza and Tomas Rivera, who worked it successfully, with good re-

sults, in gold and silver. It was abandoned on the discovery of a bonanza in the Santa Juliana mine, of which they were part owners. This happened in 1826. It was afterwards worked by the Siquerio Bros. until it became filled with bad air, caused by careless management. The mine was afterwards almost ruined by gambucinos. Sr. J. C. Henriquez, in 1858, denounced it to restore it, which he subsequently did, and it is now being worked.

The extent of possession of this mine is 700 varas vertically, the vein having an inclination of from 15 to 20 degrees, and running east and west. A drift shaft 25 varas long and 5 wide has been opened, with firm walls, from whence two shafts have been sunk, leaving a pillar of 14 to 15 varas between. A drift was run from them of large extent.

There is also a vein of auriferous, argentiferous quartz in the vein proper. It runs from 2 to 10 inches in thickness in four different veins, running parallel with each other. The ley of the ores was 24 ounces of auriferous silver per carga, or 160 ounces per ton. The intrinsic value of the silver of this mine, according to the statement of the government assayer of the district was 11 d. 2 gr. silver, 100 gr. gold, realizing 11 d. per marc at Jesus Maria prices.

The ore discovered in widening the walls, when these auriferous veins were first discovered, contained more silver than gold, yielding at the rate of \$1,500 silver to \$100 gold per carga of 300 lbs. It afterwards changed into more gold, and yielded over \$100,000 per ton. Later, this vein changed into its former state. More or less rich pockets are found at uncertain intervals. The ores are easily reduced under the common Spanish amalgamation process. This Rayo mine is situated near the top of a mountain range, from 300 to 500 varas above the creek. The entrance to the mine is on an almost perpendicular side of the mountain. Timber is abundant, and at three miles distant. It is hardly half a mile to the hacienda of Quintana.

Santa Margarita is situated at the Rosario, about three miles distant from Jesus Maria, and was formerly owned by Messrs. Gutierrez, Guerraña & Co. The vein is steep, slanting from one-half to one vara wide, its gangue being lime-spattle with virgin gold of 960 m. ley per ton. The vein runs east to west 2 degrees, incline north; extent of possession, 800 varas. The mine has filled with water, and has three shafts. The common ore always paid \$72 per ton. The better class reached \$25,961 per ton, and the best ore,

\$71,680 per ton, with gold selling at Jesus Maria at \$12 to \$14 per ounce. The improvements on the mine are one stone building—a “malacate,” or large horse-windlass. An outlay of \$4,000 to \$5,000 would put the mine in working condition, providing the malacate windlass was used.

“**San Jose.**—The Rosario gold mine is adjoining the Santa Margarita mine, and is supposed to be the same vein. The vein is almost perpendicular, and from one-half to one vara in width. Several shafts and drifts have been run. The best and second-class ore has paid a similar ley as that of the Santa Margarita, while the common and inferior ley pays from \$3 to \$4 per carga, or from \$20 to \$25 per ton, while the heavy residue of the ground and worked ore pays six ounces to the arroba, of 25 lbs. “Zaroche” is the name for gold of low color, containing silver. On one occasion, a carga of 300 lbs realized \$10,000, having reached a rich pocket. Extent of possession, 800 varas. This mine is now full of water.

“The Candelaria mine is situated about half a mile from the town of Jesus Maria. The vein runs almost perpendicular from one to two feet wide, The ore is hard, but docile under the amalgamation process. The lowest yield has never been less than \$48 per arroba of 300 lbs—\$320 to \$3243 per ton as the highest.

“The gold of this mine sells at Jesus Maria at \$10 per ounce. The mine is on the top of a mountain range 400 varas above the creek, and was full of rain water; extent of possession, 800 varas.

“The San Rafael mine is distant three-quarters of a mile from Jesus Maria town. The vein is nearly perpendicular, direction south to north; inclination from 15° to 20° east, and is about one and a half feet wide, on an average. The gambucinos filled up the most of the shafts with rubbish and destroyed them. The balance of the shafts from the first drift are filled with water. The lowest ley has never been less than one marc to the cargo, the residue or “polvillos” paying from two to three marcs silver per arroba, or about \$110 per ton. This silver is auriferous, and sells at Jesus Maria at \$16 per marc; extent of possession, 800 varas.

“The Hacienda Quintana is the point established for the reduction of the ores, and is situated in the center of the mining town Jesus Maria. It consists of three stamps and eight arastras, all the machinery of which is moved by an overshot wheel run by water. The hacienda reduces three and a half tons per 24 hours, and is fed by the creek Jesus Maria.”

(From an official report in the work of Mowry on Sonora and Arizona.) Mr. Ward says of Chihuahua:

"On entering the state of Chihuahua, the first district of any consideration is that of San José del Parral, situated upon the eastern edge of the Sierra Madre, and near the southern boundary of the state of Chihuahua, in a level country, easy of access. The mines lie amongst some undulating hills, thickly covered with pasture, and of inconsiderable elevation. The lodes are easily distinguished by their rocky crests, which rise above the smooth and rounded surface of the hills. The ores are very abundant, but poor; although from time to time some rich "clavos" have been discovered. This disadvantage is compensated by the trifling expense at which they may be reduced, from the cheapness of the animals employed in the process, and the very abundant supply of grain in the surrounding country. The only article of high price is quicksilver. The salt and magistral are abundant, and cheap; but there is not a sufficient supply of water to move machinery during the whole year; and as the rains are very variable, it cannot be depended upon, even for a certain number of months. The mines have been worked to a considerable extent, some of them being 300 varas in depth, and they are almost all in so dilapidated a state, that a considerable capital would be required to put them into repair. The water in the old levels is abundant. Parral has a numerous population, but with the exception of two or three small mines of great promise, and which require an inconsiderable outlay, it is thought that capital might be invested with a greater prospect of success in other districts, where the ruins might be more easily repaired." This was in 1827. See the report on mines in the San José district, in Chihuahua. Mr. Ward continues, speaking of the Batopilas district:

"On the western declivity of the Sierra Madre, and in nearly the same parallel of latitude as the Parral, are the famous mines of Batopilas. Its distance from Parral is about 80 leagues nearly due west, and it is situated in a ravine, similar to that of Guarisamey.

"The climate is warm yet healthy. The metallic lodes, visible by their elevated crests, are almost innumerable, and by far the greater number of them have never yet been examined. The principal mines are El Carmen, San Antonio, Pastraña, Arbitrios, Dolores, Candelaria, and Buen Suceso, with many others not necessary to enumerate. The Carmen is the mine that produced the enormous wealth of the Mar-

quis of Bustamente, and from which a mass of solid silver was extracted weighing 17 arrobas or 425 pounds. The ores of Pastraña were so rich that the lode was worked by bars with a point at one end and a chisel at the other for cutting out the silver. The owner of Pastraña used to bring the ores from the mine with flags flying, and the mules adorned with cloths of all colors. The same man received a reproof from the Bishop of Durango, when he visited Batopilas, for placing bars of silver from the door of his house to the sala for the bishop to walk upon." From this fact arose the tradition in relation to the Estacata mine, referred to in another place.

"Buen Suceso was discovered by an Indian who swam across the river after a great flood. On arriving at the other side he found the crest of an immense lode laid bare by the force of the water. The greater part of this crest was pure and massive silver and sparkling in the sun. The whole town of Batopilas went to witness this extraordinary sight as soon as the river became fordable. The Indian extracted great wealth from his mine, but on arriving at the depth of three varas, the abundance of the water obliged him to abandon it, and no attempt has been since made to resume the working. In this district the silver is generally found pure and unaccompanied by any extraneous substance. The reduction of the ores is consequently easy and simple. When the silver is not found in solid masses which require to be cut with the chisel, it is generally finely sprinkled through the lode, and often seems to nail together the particles of stone through which it is disseminated. The lodes are of considerable width, but the masses of silver are only met with at intervals.

"In the mine of El Carmen the Marquis of Bustamente, after the first bonanza, drove 30 varas in depth without meeting with anything to repay his labor, but being fully persuaded that all lodes have their alternate points of good and bad, he continued, until at the depth of 40 varas he met with the second bonanza. There is very little water in the mines of Batopilas, excepting those situated near the bank of the river, and these the river itself might be made to drain.

"The population of the town was at one time very considerable, but it has decreased of late (1827), whole families having gone to the new discoveries of Morelos and Jesus Maria—the first of which lies in the vicinity of Batopilas, and appears to possess all the characteristics by which the

lodes of that district are distinguished. It was discovered in the spring of 1826 by two brothers, (Indians by the name of Aranco) to one of whom a little maize for tortillas had been refused upon credit the night before. In two months they extracted from their mine \$270,000; yet in December, 1826, they were still living in a wretched hovel close to the source of their wealth, bare-headed and bare-legged, with upward of £40,000 sterling in silver locked up in their hut. I possess two large specimens of the ores; they are almost pure silver, and there is consequently no difficulty in reducing them by fire, however rude or defective the process."

El Refugio was also discovered in this district, and was extremely rich. "To the north of El Parral and about five leagues to the south-east of the city of Chihuahua is the ancient mining district of Santa Eulalia. It has been long abandoned, and the mines are in a ruinous condition. The ores were generally found in loose earth, filling immense caverns (salons) of which some are stated to be sufficiently large to contain the cathedral of the city of Mexico. The correctness of this assertion may require confirmation, but there can be little doubt of their magnitude, since the last bonanza extracted from one of them continued for 9 years, and one real being laid aside for each marc of silver produced, a fund was formed out of which the cathedral of Chihuahua was built, and a fund of reserve formed of \$100,000. The ores of Santa Eulalia are generally mixed with a considerable quantity of galena, which renders them fit for smelting.

"Upon the western descent of the Sierra Madre, 80 leagues from Chihuahua, is the celebrated and recently discovered district of Jesus Maria. This "Mineral" was denounced in the year 1822, but was, at first, very little worked, in consequence of the scarcity of provisions, population, and every other necessary for mining operations."

This district, on this account, was nearly abandoned at first; but such rich ores were afterwards found that the attention of the surrounding country was again called to the spot. A search being made among the neighboring mountains, upwards of 200 metallic lodes were registered in one year, within a circle of three leagues in diameter. The deepest (Santa Juliana) is not more (in 1827) than 70 varas; but it has produced ores so rich that they have been carried to Chihuahua (80 leagues) and to the Parral (120 leagues) to be reduced; there not being any reduction works on the spot when the bonanza commenced.

Near the surface of the earth, all the lodes contain a considerable quantity of gold. This diminishes as the workings increase in depth, while the proportion of silver augments.

The "Mineral" District is situated in a deep ravine, with very little level ground about it, the mountains rising on each side from the arroyo (valley).

In the immediate neighborhood are several mining districts of great promise, some ancient and some newly-discovered. Such are Rosario, (now filled with water, in 1881) Nabosayquame, El Potrero, Quipore, El Pilar de la Cieneguita, El Pilar de Milpillas, Batopilas, and Cajurichic. These form a circle, the centre of which is the Indian village of Moris, situated in an open valley, capable of considerable cultivation.

"Jesus Maria is near the summit of the mountains, and is, consequently, cold in the winter; the surrounding ridges being occasionally covered with snow. Moris is a temperate climate, almost bordering upon 'Tierra Caliente.'

"Two leagues below Jesus Maria, there is a small plain, well adapted for reduction works, and affording pasturage for animals; but it is necessary to open a road to it down the ravine." (Ward on Mexico, vol. 2, pages 576 to 584, inclusive.)

Guazapares District.

This district is situated near the border line of Sinaloa, and is reached by a road or mule-trail from Alamos, in Sonora.

The mines of Patrocina and Dolores are the principal ones in this district. These mines were owned by a company organized in this city, in 1874, known as the Patrocina and Dolores Mining Company. The company, being induced by representations of the rich quality of the ores of these mines, purchased them, and sent a 10-stamp mill into the mountains, with boiler, engines, etc., as near as it could be transported to the mines; but the region being so mountainous, and traversed only by pack-train trails, accessible only to mules, and as there was no other manner of transportation, the mill failed to reach its destination, and now lies scattered on the road, in a ruinous condition. The mill was then abandoned, and the mines attempted to be worked by the "batea" process, as the ore assayed as high as \$100 per ton. The result was an abandonment, after some \$90,-

000 were expended in the experiment. These mines are undoubtedly good mines, but are inaccessible, and therefore will not pay the expenses of working them.

Guadalupe y Calvo, in the Guadalupe y Calvo District, is the largest mine in the State of Chihuahua. It was leased in former years to an English company for a period of 20 years, and supported a population of 10,000 people. This is a celebrated mine, on account of its producing immense fortunes for the English company. When the lease expired, the original owners, who are Mexicans, took possession, with all the improvements, and continued to work it. While it was in possession of the English company, they secured the erection of a mint by the Mexican government, to save the expense of transportation. A 20-stamp mill was used to reduce the ore, and about 80 *arastras*. The latter were run by Mexicans on shares. The depth reached in the mine is about 900 feet. The width of the vein averages from 20 to 25 feet, and is well defined. The average assay was about \$200—the lowest, \$40, and the highest, \$2,000. The ore was free milling. The mine is located on the side of a mountain, 500 feet above the creek; but it is now abandoned, and the shafts and drifts are filled with water on the lower levels.

The Carmen mine is located just beyond the border line of Sinaloa, in the State of Chihuahua, on the side of a mountain near the summit, in the main range of the Sierra Madre. The depth of the mine is about 300 feet or more; width of the vein about 5 feet. The average assay about \$120 per ton, and the ore runs pretty even from \$80 to \$300 per ton. It is owned by a Mexican. The ore is rebellious, and contains but a small percentage of gold. The mine is not a mile distant from the border, and about 25 miles from the town of Cosala in Sinaloa.

DURANGO.

CHAPTER I.

Physical Features.

A large proportion of the state of Durango is situated upon the table-lands, and the capital, though surrounded in most maps by mountains, lies in the midst of a vast plain, which, to the north-east, extends, with few interruptions, as far as Chihuahua and Santa Fé, in New Mexico. To the west, both north and south, the Sierra Madre extends, forming a barrier upon the Pacific side, and the hot low lands of Sinaloa occupy the space between the foot of the mountains and the Pacific Ocean. The state is bounded on the north and north-west by Chihuahua, and on the east by Coahuila, and on the south-east by Zacatecas, and on the south by Jalisco, and south-west by Sinaloa. It is completely surrounded by Mexican territory, and is not considered as one of the border states, though we have included it in our work on account of its location and important interests connected with those states on the frontier.

The state of Durango is divided into 13 districts, as follows: Durango, Nombre de Dios, Mesquital, Cuencame, Uzas, Mapime, San Juan de Guadalupe, San Juan del Rio; Indee, Papasquero, El Oro, Tamasula, and San Dimas. The state has but few manufactures. Its riches consist almost entirely in mines and agricultural produce, which last is so considerable that the lands already brought into cultivation are supposed to be sufficient for the support of a population five times as large as the State now contains. Consequently, it has considerable trade with the surrounding region.

The raising of stock is carried on extensively also; most of the estates, besides being devoted to agricultural products, are also devoted to the raising of large herds of horned cattle, horses, mules, and sheep, of which last 150,000 are sent every year to the Mexican market. The Hacienda de la Sarca alone possesses a stock of 200,000 sheep and 40,000

mules and horses. That of Ramas, which consists of 400 "litios" or sheep ranches, has 80,000 sheep, and the Guatimape 40,000 oxen and cows. The valley of Poanos, about 45 miles from the capital east, contains nothing but corn lands. It is watered by a river which runs through the center of the valley, and on this river are nine "haciendas de triego" (corn estates) in immediate succession, which supply the capital with flour of the very best quality, at from \$6 to \$8 per fanega. Sugar might be extensively raised in the valley of the Sierra Madre, where water abounds and climate might also be selected at pleasure. Sugar is at present brought from the valley of Cuencame at a distance of 250 leagues. It sells at an enormous price—\$5 per arroba, and often at \$10. Indigo and coffee might likewise be reckoned among the natural productions, as they are found wild in the barrancas or ravines of the Sierra. Sugar, we believe, is raised to a small extent in some of the valleys.

Mr. Ruxton describes the ranchos and haciendas as follows: "The ranchos and haciendas in Durango and Chihuahua are all inclosed by a high wall, flanked at the corners by circular bastions loop-holed for musketry. The entrance is by a large gate which is closed at night, and on the azates or flat roof of the building a sentry is constantly posted day and night during Indian troubles. Round the corral are the dwellings of the peones, the casa grande or proprietor's house being generally at one end and occupying one or more sides of the square." He goes on to speak of large herds of cattle and horses to be found on the plains, but of one district he says: "From El Gallo to Mapimi a mule-track leads the traveler through a most wild and broken country, perfectly deserted, rugged sierras rising from the mesquite-covered plains, which are sterile and entirely destitute of water. This part of the country is far out of the beaten track from Durango to Chihuahua." Thus it is seen that sterile tracts are also to be found in this state. The whole of the state is mountainous and contains no rivers, except a few small streams.

CHAPTER II.

City of Durango.

Of the City of Durango he says: "The City of Durango was founded by Velasco el Primero, and it may be considered the 'ultima thule' of the civilized portion of Mexico. Beyond it to the north and north-west stretch away the vast uncultivated and unpeopled plains of Chihuahua, the Bolson de Mapimi, and the arid deserts of the Gila." The distance to Mexico City is 650 miles from Durango, the capital of the state, which is situated 65 leagues north-west of Zacatecas. The population is 22,000. The state had, in 1876, 185,000. Both the city of Victoria and most of the other towns of Durango—Tamasula, Sianori, Mapimi, San Dimas, Canelas, Cuencame—take their origin from the mines.

The town of Victoria, or Durango, is situated in the plain heretofore mentioned, and is the principal town of the state. The streets are pretty regular, and the town contains a large plaza called the Plaza Mayor, one theater and other public buildings, which were built by Zambraño, a rich mine-owner, who is supposed to have extracted from his mines at San Dimas and Guarisamey, upwards of thirty millions of dollars.

The capitol is located here, a mint, and the Casa del Apartado, (a place for the separation of gold from silver) a glass manufactory, a tannery, and a fabrica de tabacos. The police of the town is well organized, and robberies almost unknown. Legal proceedings are summary, the legislature having passed a law which concludes legal proceedings in three days, in cases of robbery.

Tobacco is produced, also, in the State, to some extent.

There is much trade at this point, principally in bullion from the mines, and among the principal business firms may be mentioned, Julio Hildebrand Sucesores, Doorman & Co., Giron, Stahlknecht & Co., Francisco Gurza & Co., Juambels Hermanos, and Francisco Alvarez & Co.

The towns of Villa del Nombre de Dios, San Juan del Rio, and Cinco Señores de Nazas, are almost the only cities in the State connected with mines. The two first are supported by an extensive trade in "vino mescal," (a sort of brandy distilled from the maguey or American aloe, sometimes called the century plant, which requires from seven to ten years to develop.

The last-named town is supported by the cotton planta-

tions upon the banks of the river Nazas, from which the manufacturers of Saltillo, San Luis and Zacatecas draw their supplies. The cotton is cleaned and manufactured in those places.

The territory of the state is divided into ten partidos or districts, viz: Durango, Nombre de Dios, San Juan del Rio, Cinco Senores de Nazas, Cuencame, El Oro, Indee, Papasquero, Tamasula, and Guarisamey.

The state is well supplied with all the necessities of life. Maize is sold for 12 reals to the fanega; flour, \$10 to \$12 per carga of 300 lbs; fruits and vegetables of all kinds abound, peaches and potatoes, etc. Mules are bought by the wholesale at \$18 per head; horses, at \$8 to \$9; sheep at \$1. A fat ox or cow brings \$12. In the vicinity of the capital, all the materials for building abound, also lime and stone. The flint used for the manufacture of glass is found at the foot of the Cerro del Mercado; lead from Cuencame and Mapimi—\$4 per quintal. Copper is brought from Chihuahua, and sells for \$24 per 100 lbs. Excellent iron from the Cerro del Mercado is manufactured into mining tools, and is so hard as not to need the usual tip of steel.

Mining Districts of Durango.

The following is from Mr. Ward's book on Mexico:

"The principal mining districts of Durango are located in the Sierra Madre, and east of the Sierra Madre. Those in the Sierra Madre are, Guarisamey, San Dimas, Gavilanes, Toyoltita, Canelas, Sianori, Bacis, Tamasula, Ventañas, and San Andres. Those east of the Sierra Madre are, Cuencame, (near the river Nazas) Yerba Buena, Mapimi, Indee, El Oro, and Guanacevi.

"These districts, and, indeed, most of the districts of the north, including those located in Durango, Sonora, Chihuahua, and Sinaloa, are known throughout Mexico as possessing ores of a superior quality; and at a short distance from the surface, namely, from 30 to 45 feet, the paying ores commence: whereas, the main vein of Guanajuato, in the southern mines of the republic, yields but little until some 200 to 300 feet is reached. The metals seem to increase in richness as you approach the north from Mexico City; so that in the district of Jesus Maria, in the State of Chihuahua, in that great branch or spur of the Sierra Madre which separates the States of Durango and Chihuahua from those of Sonora and Sinaloa, to the north and west, the ores of the

mine of Santa Juliana appear by a certified report from the Deputacion de Minera to average seven and eight marcs of silver per carga, (300 lbs. to the carga, and \$3.20 to the marc) which is the average produce of ten cargas of good ore in Guanajuato, while ores of the best quality yield as much as from 4 to 10 marcs per arroba, (25 lbs.) or 40 marcs per carga. This Santa Juliana mine of the Jesus Maria District, before mentioned, assayed with this result at about 210 feet in depth.

"In the District of Batopilas, (also in Chihuahua) where the matrix is, in general, quartz, the pure malleable silver intermixed with it often exceeds in proportion one-half, and masses of this description, of the weight of 11 arrobas (270 lbs.) have been raised. One of five arrobas in weight (125 lbs.) was in existence at Chihuahua when Mr. Ward visited it in 1827, and he was solicited to purchase it for the British Museum.

"Up to 1827, the only three districts of the north that were worked with any regularity were. Santa Eulalia, Batopilas, and Guarisamey.

"It is now on record at Durango, that Zambrano, who was the proprietor of all the principal mines of Guarisamey and San Dimas, paid, as the king's fifth, upon the silver raised from his mines, between the period of their discovery in 1783 and 1807, when he died, \$11,000,000. These immense riches were derived principally from five great mines in the San Dimas district: La Candelaria, San Juan Nepomuceno, Cinco Señores, La Abra, and Topia. The regular returns from the Candelaria alone," Mr. Ward says, in his work on Mexico, from which the foregoing on the mining districts of Durango is taken, "prove the annual profits never to have been less than \$124,000, and which, in some years—within a period of five years—reached as high as \$223,082. The ores of this mine, during the whole of this period, appear to have produced from five to six marcs per carga, (of 300 lbs.) and often to have yielded 20, and even 30 marcs. When this mine had attained its greatest depth, (300 varas) the water was still brought up from the bottom of the mine in leathern buckets, upon men's shoulders, and in this laborious manner was the mine worked. It was very rich, however, as the results proved. The proportion of gold in the ores of Guarisamey is very great, amounting sometimes to 2100 grains per marc."

The principal mining districts of Durango are those of San Dimas, Gavilanes, Guarisamey, Tamasula, Canelas, Si-

anori, Topia, Picachos, Biramoa, Bajada, Papasquiera, Guanacevi, Indee, El Oro, Cuencame, and Mapimi. The first three, with Tamasula, Canelas and Sianori, are situated on the western boundary of the State, upon the descent of the Sierra Madre to the Coast. The last five are located east of the Sierra Madre.

Gavilanes, Guarisamey, and San Dimas lie nearly in the same parallel with the city of Victoria, about five days' journey to the westward.

Three days are traveled on the table-land, and the other two through the fastnesses of the Sierra Madre.

The Guarisamey district is situated in a deep cañon, overhung by the highest mountains of the Sierra Madre, about 9,000 feet.

Gavilanes, on the contrary, stands upon a projecting platform on the side of the mountains not very far from the summit, and when seen from a distance, appears more like the abode of eagles than that for men.

In this district the mines are all opened upon one lode, which is of large dimensions, almost as large as that of Guajuato. The vein at the surface was only one vara, and increased gradually, until at the depth of 70 varas it was ten to fifteen varas in width. This is the only mine in the district.

Guarisamey, the head of the surrounding district, owes its discovery to the lode of Tecolota, which crosses the high road to Cosala, in Sinaloa. The abundance and richness of its ores soon brought prospectors, who discovered the veins of Araña, Cinco Señores, Bolanos, Pisamide, Candelaria, Dolores, and Topia, with many others, every one of which were worked profitably. These lodes, or the most of them, were denounced by Zambrano, and all produced bonanzas, some of which were very rich.

The mine of Araña was remarkable for containing between two small strips of rich ore, a cavity filled (like the bovedas of the mine in Zavala at Catorce) with a rich metaliferous dust, composed almost entirely of gold and silver. It was also distinguished by many of those rich spots, commonly called "clavos," which, although of small extent, in a horizontal position, were constant in perpendicular depth. The "clavos" were worked to the depth of 180 varas, though the mine had no shaft; and during the whole of this space, the most ordinary ores yielded from 10 to 15 mares to the monton of fifteen quintals, while the richest are said to have produced from 70 to 105.

The lode of Cinco Señores is five varas in width, and the qualities of the ores fully equal to their abundance. The mine is 300 varas in depth; few of the oldest mines, however, exceeding 140. Near the summit of the mountains that separate San Dimas from the Guarisamey lie the mines of Bolanos and Piramide—with others, all of small depth. The bonanza of Bolanos at first was celebrated, but the vein was afterwards lost.

On the north side of the same ridge lies the famous mine of La Candelaria, from which a very large proportion of Zambrano's fortune proceeded. It is situated near the summit of the mountain immediately opposite to the mines of Cinco Señores, and Bolanos, there being about three hours of difficult ascent from Guarisamey to these mines, and nearly the same from San Dimas to the Candelaria. On the San Dimas side the mountains are very precipitous, and thus the mine of Candelaria has been worked to the depth of 600 varas by adits driven one below the other on the lode, the whole expense being defrayed by the value of the ores produced. The last, a most magnificent work, is driven nearly 500 varas into the mountain so wide, that a stage-coach might pass through it to the very heart of the mine, which may be worked 600 varas lower by pursuing a similar plan. The rich ores of the lode are found in separate beds perpendicular to the horizon, called "clavos a pique," and divided by intermediate masses of rock. The beds of ores have been constant from the surface down. (The mine, I believe, is not now worked.) A little below Guarisamey and in the same ravine is the district of San José Tayoltita, which contains the celebrated mine of La Abia, one of the last worked by Zambrano, about 50 years ago. It also contained bonanzas, but was abandoned on account of the influx of water. The pillars of this mine were extracted by the nephew of Zambrano, and it was left in ruins." (The most of the above information was obtained from the celebrated work of Ward on Mexico, and is consequently not as late as we would like to obtain, but we give it in order to locate the many old mines that are appearing in the market.) Mr. Ward continues:

"A little to the north of Guarisamey is the mineral district called Bacis, which was not visited by Mr. Glennie, on account of the rains having destroyed the roads. The same cause prevented him from reaching Tamasula, Canelas, and Sianori, all valuable districts, the two last of which are situated on the extreme north-western boundary of the

state of Durango. Bacis has long been given up on account of the difficulty of draining the mines without machinery, but it is said that the lodes were extremely rich in native silver, and that in the principal mine solid masses of this metal had been actually cut out, when the progress of the work was stopped by the water. This may be one of those embellishments in which mining districts abound, but there is nothing improbable in the supposition, the same thing having occurred in other parts of the Sierra Madre, as well as in the mine at Bolanos, from which I possess a piece of silver which, but for a small portion of the matrix attached to it, would, from its size and purity, be pronounced to have been already submitted to the action of fire." The statement as to cutting pure silver from the mine is not so extraordinary as Mr. Ward seems to have thought, as this has often been done from mines in the Batopilas district and others in Chihuahua.

The other mining districts given by Garcia Cubas are Topia, Tominil, Corpus, Comitana, Durango, Noria, Avino, and Coneto. The following mining districts are being worked with good results: San Dimas, Topia, Picachos, Birimoa, Bajada, Canelas, Papasquiera, and Tamasula.

Iron Mines of Durango.

The mines of Durango are kept free from water mostly by the use of the malacate, or horse-windlass, and Mr. Ward says that "their power of keeping down the water has excited as much astonishment almost as the steam pump. The mines are worked as long as the water can be raised without inconvenience by two or three 'tenateros,' (carriers) with leathern buckets made from raw-hide, and abandoned when the discharge of this duty became too laborious. Most of the principal districts may consequently be regarded as virgin ground, and there are few in which the old shafts might not be again brought into activity with a comparatively small outlay.

The iron mines of this State are also extensive, and, if properly managed, they alone would become profitable, for there is no article for which the demand is greater than iron, and none, the supply of which from Europe is attended with such manifold disadvantages.

Durango might, in two years, be rendered the depot of iron for Sombrerete, Zacatecas, Catorce, Batopilas, and all the mining districts south of Chihuahua, nor would the suc-

cess of the iron mines already taken up at Encarnacion interfere with this prospect, as their market would be confined to the central mining states, beyond which, from the difficulties of communication, their operations would hardly be extended." (Ward on "Mexico," in 1827.)

This subject has attained more importance since the construction of railroads has been commenced throughout the Republic, and the cost of iron imported for rails is as follows, taken from the "*El Minero Mexicano*" of December 9th, 1880:

	Per Ton.
Steel rails in England.....	\$28.00
“ United States.....	31.00

COST OF RAILS IN MEXICO.

Price in England.....	\$28.00
Freight to Vera Cruz	9.00
Landing.....	2.00
Freight to Mexico according to tariff.....	54.32
Total.....	\$93.32

COST OF RAILS IN SAN LUIS POTOSI.

In England.....	\$28.00
Freight to Tampico.....	9.00
Landing.....	4.00
Freight to San Luis Potosi.....	60.00
Total.....	\$101.00

Cost of rails in New York.....	\$31.00
Freight to Tampico.....	15.00
Landing.....	4.00
Freight to San Luis Potosi.....	60.00
Total.....	\$110.00

The *El Minero Mexicano* very naturally deduces from this that the rails had better be purchased in England, and imported to the ports of the republic, on account of the difference in the price of the rails as well as the freight. But if the extensive iron mines of Durango were developed the rails could be manufactured in the republic at a less price than they can be imported from either of the points mentioned, since the rails could be transported over the table lands of Durango, south-east to Mexico, over a railroad now

being built on a highway that is comparatively level, that puts the state in direct communication with the City of Mexico and the numerous railroads that are being built from that point throughout the republic. Then the rails could also be transported north to the Southern Pacific or Texas railways and shipped to El Paso, and from thence to Guaymas and Mazatlan, or to Chihuahua, to the railroad that is being built from that point to El Paso, and through a practicable pass in the mountains to Mazatlan, by way of Fuerte and Culiacan, or to Alamos and Guaymas. A large proportion of the territory of Durango, as we have seen, is situated upon the table lands, and the capital is in the midst of a vast plain, or rather in the south-western portion of the plain, that opens up a communication both to the north-east, and south-east to the points designated. On the west, however, and the south-west, the Sierra Madre extends, reaching the valleys and plains of Sinaloa by immense steppes or elevated plateaus, one above the other, which forms a barrier that is almost inaccessible, although a pass is reached on the north-west leading into Chihuahua, where the descent is more gradual, making communication practicable with Chihuahua and Alamos, in Sonora, thence to Fuerte, and from thence to Culiacan and Mazatlan, and Cosala, a new wagon road having lately been built from Mazatlan to Cosala. The iron industry is a most important one to Mexico; and foreign capital, invested properly, would be of great value to the republic, as well as very remunerative to the owners. A foundry could be built at the mines, and rails manufactured, and all kinds of mining machinery, and thus a vast trade could be opened. Says Mr. Ward:

“Iron abounds within a quarter of a league of the gates of Durango. The Cerro de Mercado is entirely composed of iron ores, of two distinct qualities, (crystallized and magnetic) but almost equally rich, as they both contain from 60 to 75 per cent. of pure iron. The operation of smelting these ores is attended with considerable difficulty. An iron foundry, lately set up upon the banks of the river, 20 leagues from Durango, has failed, from the want of knowledge of the proper mode of treating the ores. A hacienda has been built in a situation where there is both water for machinery and an abundant supply of timber and charcoal; but as the proprietors do not possess the means of constructing a road for carts, (although from the nature of the ground, it might be accomplished with a very inconsiderable outlay) the conveyance of the ores on mules to the

reduction works materially diminishes the profits of the speculation. With regard to the difficulty of working them, it might undoubtedly be overcome, as from the affinity of the iron of El Mercado to that of Dannemora, Swedish forgers would understand the nature of the process at once."

Since the writing of Mr. Ward's book, the ore has been successfully treated, and manufactured into excellent mining tools, etc.

Mr. Geo. F. Ruxton, in his valuable work, entitled, "Adventures in Mexico and the Rocky Mountains," published in 1848, says that "this enormous mass of malleable iron, as he terms it, is isolated on the plain, and is supposed to be an aerolite, and is, consequently, not connected with any ledge or bed of ore. He also says its composition and physical character is identified with certain aerolites which fell in 1751, in Hungary. It contains 75 per cent. of pure iron, according to the analysis of a Mexican chemist, and some specimens which Humboldt procured were analyzed by the celebrated Klaproth, with about the same result."

We obtain the following data from a valuable pamphlet published in Mexico in 1878, entitled, "El Cerro de Mercado de Durango por Federico Weidner," in which the writer compares very justly the difference of the price of iron used in the foundry at Mazatlan with the price in England and also at Durango, as follows:

"At the port of Mazatlan, for example, in all iron of second fusion (pig iron) which is used in the establishment of Señor D. Joaquin Redo, as well as first material (or iron ore) the price per ton of 2,240 lbs. which is manufactured or melted in England, is as follows:

First price of the invoice, per ton.....	\$15 to \$25
Freight by water, per ton	5 to 7
Unloading and carriage by mules, per ton...	5
Custom house duties, at 30 cts. per hundred,	5

Total.....\$36

a little more or less per ton, or \$1.60 per quintal.

"In the place of English iron, if they want to use Durango iron, the cost at the foundry of Flores would be \$3 to \$4 per quintal, or \$60 to \$80 per ton.

"Adding to this the freight between Mazatlan and Durango at \$3.50 per quintal, or \$80 per ton, with the purchase price

at Mazatlan, at \$60 to \$80 per ton, makes a total of \$156 per ton, more or less, or \$7 per quintal."

The iron of Mazatlan, at \$6 to \$10 per quintal, when cast by the piece, costs \$12 to \$16 for complicated work; but when half-finished or plain, it costs \$8 per quintal, or \$180 per ton; so that in Durango, the minimum price is \$15 per quintal, or \$336 per ton. Adding to this the freight to Mazatlan, makes the minimum price for finished iron \$20 per quintal, or \$448 per ton."

This is sufficient argument, we take it, for the establishment of a foundry at Durango alongside of the Cerro de Mercado, or mountain of iron, in the immediate vicinity. The author goes on to show that since the first cost in England is \$20 per ton while it can be procured in their neighborhood for \$4 to \$6 in ore, and carriage to a foundry erected would not make it more than \$5 to \$7. He also mentions the existence of furnaces, retorts, and other apparatus which were abandoned by various parties up to 1856, on account of their being unable to successfully reduce the ore, and points out the fact that the ore of the Cerro de Mercado can be successfully treated and manufactured at a very great profit. He also publishes a scientific examination of the ore and the surrounding locality, its extent and analysis, which we condense below. He goes on to explode an error that exists on the part of travelers and scientific men that this immense mass of iron is an aerolite, and publishes in the pamphlet the geological structure or formation around and underneath it, and pronounces the aerolite theory a *cabal* on the Cerro de Mercado, and further that it is of volcanic origin; and points out the fact that the iron mines of England have produced 15,000,000 of quintals annually for the last 330 years, amounting to \$9,900,000,000, or more than seven times the amount of gold and silver coined from all the mines of Mexico from 1690 to 1803. He says the Cerro de Mercado is 1,750 varas in length from east to west, and 400 varas in width, and the height from the surface of the plain of San Antonio 234 varas, which cuts it, as it were, in the middle horizontally, and the resulting estimate in cubic measurement is 60,000,000 cubic varas, and by analysis of the contents or percentage of pure iron it contains, estimates the amount of ore in the whole mass at more than 5,000,000,000 of quintals, from which he calculates that, taking the percentage of pure iron to be 50 per cent., although it assays 75 per cent., the whole mass will then produce 2,500,000,000 quintals of metallic or pure

iron, and, estimating its value at \$5 per quintal, it would represent not less than the enormous sum of \$12,500,000,000, or more than three times all the products of the mines of Mexico since 1772 to 1880, which we have estimated to be about \$4,000,000,000.

Further, in order to fully comprehend the immense amount of iron in this solid mass, by calculating the amount produced in England at fifteen millions of quintals annually for the last 330 years, the whole amount produced is 4,950 millions of quintals, or only a little over one-third of the amount of pure iron contained in the Cerro de Mercado, which has been aptly termed a mountain of iron, and lies almost untouched, while the same metal now so much in demand within the boundaries of the republic, is imported from England, as we have already shown; the difference in freight, as well as first cost, giving the trade to England.

Curious Caves of Durango.

From Cosala, in Chihuahua, to the foot of the mountains, a distance of five leagues due east, Santa Ana, a small rancho, is situated, and near it are some mines of silver and magistral. The road here enters a cañon, and the traveler soon gets enveloped in the mountains, which rise almost perpendicularly. Strata of porphyry, granite, limestone and alabaster are found on each side.

A small stream runs along the bottom of the cañon, and leads up to the table-land, which soon commences. On the boundaries of Durango, immense herds of cattle are seen grazing on the plains, mingling with elk and the fallow deer, and black-tailed deer; the latter, however, frequents mostly the inaccessible mountains.

The celebrated caves of the state are located 30 leagues from San Antonio, and 16 leagues from Cosala, or about 48 miles. The caves are situated in a small circular valley or basin 100 yards in diameter. The road lies down the cañon, 14 leagues below, to this basin.

The caves are called Las Cuevas de San Miguel. The largest is called San Miguel, and is 240 feet in length and 80 feet high, and 150 feet wide, forming a large room. The roof is a regular arch in formation or curvature. In the back wall, opposite the entrance, are found openings of different sizes. One of them was penetrated by a traveler, who describes them in a book entitled, "The North-western Part of Mexico." He says, he penetrated 130 feet, and found intricate windings and subdivisions or openings on each side.

The origin of the caves is unknown, but it is supposed that they were inhabited by the aborigines or ancient Aztecs. They have never been completely explored, as near as we can ascertain, and the attention of antiquarians is called to them, as relics of the former inhabitants might be found. From the caves, the distance to Plomosas is 40 leagues, and to the city of Durango, 40.

Coahuila.

The state of Coahuila is divided into five districts: Saltillo, Parras, Viesca, Monclova and Rio Grande. The state is extremely mountainous, and the vast plains called the Bolson de Mapimi extend throughout the western portion, a deserted region covered with sands and alkali. The principal mountains in the north are El Pico Etereo, La Sierra del Carmen, and Lomerios de Peyotes. In the center, the Sierra of Santa Rosalia, San Marcos, La Fragua, La Paila, Sierra Azul, Coahuila, Chiflon, Angostura, and Sierra Madre. Saltillo is the capital, with 8,000 inhabitants.

The whole state is very sparsely settled, and, as yet, is almost entirely undeveloped, on account of its lack of sufficient water and the constant incursions of the Apaches upon the settlements.

The principal productions of the state are stock, and agricultural products, such as grapes and fruits of various kinds. Some mines are also worked.

Nuevo Leon.

The state of New Leon is bounded on the north and north-east by Tamaulipas, and on the west, north, and south by Coahuila, and on the west and south by San Luis Potosi. In the western part, the state is traversed by the Sierra Mountains, extending from north to south, and in the north-east it is occupied by extensive table lands broken by mountain peaks extending from the base of the mountains toward the north-eastern border where the table lands break into cañons traversed by arroyos. From the center of the state to the eastern border an extensive plain stretches from the base of the mountains. This extensive valley or plain is traversed by the river San Juan, which rises in the mountains in the western part of the state and passes Monterey, the capital, which is situated on its banks, and flows in a north-easterly direction across the border into Tamaulipas.

and then into the Rio Grande. This is the only river in the state, and its main branches are the Pesquiera and the Rio Pilon.

The valley of the San Juan is very fertile on the river bottoms and produces the usual tropical productions. Stock-raising and agriculture constitute the principal trade of the state. The capital (Monterey) has about 13,500 inhabitants, and the state is divided into 44 municipalities, with a population of about 200,000.

Tamaulipas.

The state of Tamaulipas consists of the extreme north-eastern portion of Mexico, and is divided into four districts—namely, Del Norte, Del Centre, Del Sur, and Cuarto Distrito. The principal ports are Matamoras, on the bank of the Rio Bravo or Rio Grande, near its mouth; Tampico, on the Tampico, Soto la Marina. Victoria is the capital of the state; inhabitants, 6,000. The south-eastern portion of this state is broken with the spurs of the Sierra Madre, while the northern and north-eastern portion is covered with plains. It is bounded on the north-east by the Rio Grande River and Texas opposite, and on the east by the Gulf of Mexico, and south by Vera Cruz and San Luis Potosi, on the west by New Leon. A small strip of the state extends along the Rio Grande on the north-west.

The town of New Laredo is the proposed northern terminus of the Mexican Central Railroad, and is situated in the narrow strip of the state before mentioned, in the extreme north-western part of the state. The city of Matamoras and Tampico are its principal sea-ports, and the chief business of the state is stock-raising and some agricultural productions. Matamoras is located on the Rio Grande about 20 miles from the mouth of the river, and Tampico is located at the extreme south-eastern portion of the state, on the Barra de Tampico.

Arts and Manufactures.

To fully comprehend the progress made by Mexico in arts and manufactures, we append the following information from the work of the learned and able writer, Antonio Garcia Cubas, published in Mexico, in 1876, from which we have obtained most of our information concerning the resources of Mexico. The following statements of facts will open the

eyes of many who think the people of Mexico a barbarous and half-civilized people; and it may as well be stated here, that although rude implements of agriculture and mining are found to some extent in portions of the republic, yet vast improvements have been going on, as the following from the pen of Cubas will verify. The work has been translated by Mr. George Henderson, of Mexico:

“Carved work and filigree work in gold and silver yield in little or nothing to similar productions from abroad. The carriages and household furniture made in Mexico, with the exception of silk stuffs, can compare in taste and solid workmanship with the best that can be imported from foreign countries.

“In the fine arts, both in painting, as well as sculpture and architecture, our Academy of San Carlos, reported by travelers to be the first in America, displays the progress they have acquired. Some of their works will be exhibited to the public at the Philadelphia Exposition. The fabrication of textures, as well as other manufactures, has increased astonishingly. Several factories, sugar-mills, and distilleries, are established in the states of Mexico, Pueblo, Vera Cruz, Jalisco, Morelos, Guerrero, Tobasco, Oaxaca, and Yucatan.

“Earthenware is made in Guanajuato, Mexico, and Pueblo in the state of Jalisco; and in the valley of Mexico there are various paper mills; also, some glass factories in Mexico and Pueblo; also, (at Durango) cotton factories in the greater part of the states; silk factories in Guanajuato, Queretaro, and Mexico. The number of cotton factories in the republic exceeds seventy. The states that may be considered as manufacturing districts, being those of Pueblo, Jalisco, Queretaro, Mexico, and Vera Cruz.”

This number of factories existed in 1875, and, since that time, many others have been built in Sinaloa, Sonora, and other states. Also, flour-mills, glass and paper factories have since sprung up, and we only give the data in regard to flour-mills of the state of Sonora, obtained from Mr. David B. Blair, acquired by him through Mr. Ortiz, of this city.

Total number of flour-mills on the line of the Sonora R. R., 31. There are, besides, many small mills that manufacture flour for local consumption. The total amount of tons of flour produced is 9,100 tons, from the various haciendas in Sonora. Besides this, the production of numberless other wheat-producing regions never reaches the port of Guaymas.

Imports and Exports.

The Mexican government maintains mercantile relations with England, France, the United States of America, Germany, Spain, and the Island of Cuba, Belgium, Italy, Central America, the United States of Colombia, and the Equator.

According to the Annual Reports, the value of the importations may be estimated at 29,000,000 of dollars, as follows:

	For 1875.
Cotton and cotton goods.....	\$10,500,000
Groceries, wines and spirits.....	5,000,000
Articles free of duty.....	3,300,000
Hardware and ironmongery.....	2,100,000
Miscellaneous	2,000,000
Linen and hemp goods.....	1,400,000
Woolen goods.....	1,400,000
Mixed goods.	1,400,000
Silks.....	1,000,000
Earthenware, glass and crystal ware.....	600,000
Drugs and chemicals.....	300,000
Total.....	\$29,000,000

This amount was imported from the following countries:

	For 1875.
England	\$10,200,000
United States of America.....	7,500,000
France	4,780,000
Germany.....	3,800,000
Spain and the Island of Cuba.....	1,400,000
United States of Colombia.....	1,200,000
Central America.....	100,000
Italy, Belgium, and American Republics.....	20,000
Total.....	\$29,000,000

The exportations amounted to 32,300,000 of dollars, as follows:

	For 1875.
Gold and silver coin.....	\$24,000,000
Ores and minerals.....	1,800,000
Hides and skins in general.....	1,800,000
Henequen, Ixtle and cordage.....	1,000,000

Timber and dye woods.....	\$1,000,000
Coffee	600,000
Vanilla	400,000
Cochineal	300,000
Cattle.....	200,000
Tobacco.....	150,000
Orchilla.....	130,000
Fine pearls.....	110,000
Caoutchouc or Indian Rubber.....	100,000
Sarsaparilla.....	90,000
Wool	90,000
Sole and upper leather.....	80,000
Indigo	80,000
Jalap root.....	80,000
"Coquita," small cocoanut.....	50,000
Frijoles (beans).....	40,000
Cotton	30,000
Mother of pearl.....	25,000
Starch	25,000
Wheat.....	20,000
Other agricultural and industrial productions....	100,000
Total	\$32,300,000

These exports are made to the following countries:

	For 1875.
England, to the amount of.....	\$12,500,000
United States of America.....	12,000,000
France	5,000,000
Germany.....	1,500,000
Spain, and the Island of Cuba.....	800,000
Central America	150,000
Italy and Belgium.....	50,000
	\$32,000,000
The balance goes to other countries.....	300,000
Total.....	\$32,300,000

[The above estimates we obtain from the valuable work of Antonio Garcia Cubas entitled "The Republic of Mexico," published in 1876 in the city of Mexico.]

Thus we see by a comparison of the tables that England imports nearly \$300,000 more than the United States of America, and that only about one-quarter of the entire im-

ports of Mexico come from the United States, while England, in her little island from her warehouses at Liverpool and London, imports nearly one-third of the entire trade, and Germany imports less than either the United States or England.

Of the exports, England still commands \$500,000 more than the United States, though they are nearly equal, each absorbing over one-third of the entire trade. The balance of trade we also see is in favor of Mexico, the exports being in excess of the imports some \$3,000,000. The lesson of this table we leave with our readers. It is plain to be seen that with a little effort the United States may take the lead and eventually supply the most of this trade, or by establishing warehouses in the manner stated elsewhere, command eventually the greater proportion of the \$30,000,000 or \$40,000,000 imports annual trade of Mexico. This trade, however, we thus see in its infancy, and as it increases it would prove of rich profit to our ports.

Through the Mexican Consul we have obtained the following data from the "Memoria de Hacienda y Credito Publico," dated January 12, 1879, and issued as a public document at the City of Mexico: "The exportations for the year 1877 to 1878 reaches the amount, according to the balances respectively, of \$28,777,508.07 (No. 5, Part IV). The legal importations of merchandise for the year 1877-78, may be estimated at the value of \$21,462,621. Probably during the present economical year (1879) there will be less importations of foreign merchandise. It is calculated that more in value (about \$4,000,000) are exported annually than imported by foreign merchants. In the past few years it has been notable that emigration to the capital has increased in Mexico and diminished the production of former years." From the same work we gather that Mexico is now supplying her own trade to a considerable amount by home manufactures, which has not failed to reduce the foreign trade. The same report says the falling off has been caused by the general effects of revolutions, and calculates the falling off from 1867 to 1877 at about \$12,000,000. The work was printed in 1878, and consequently the last two years' report has not yet reached the public, but from the large importations of railroad accouterments which are now being shipped principally from England and Hamburg, with the brisk reopening of her mines, will undoubtedly bring her commerce of the present year up to in the neighborhood of former years, if it does not exceed them. One notable fact ap-

pears, however, that the balance of trade is undoubtedly in favor of Mexico, as she claims, of about \$4,000,000, as a liberal estimate. The amount of smuggling will nearly balance the imports and exports either way of that class, but calculating even that the smuggling of imports vastly exceeds the exports unlawfully shipped and transported from her borders, yet it cannot exceed it more than the allowance made of about \$3,000,000; hence, in any event, it is apparent that Mexico is not being impoverished, but is gaining continually against the commerce of other nations.

From the "Hacienda y Credito Publico" of January 12th, 1879, we also obtain the following interesting data: From 1874 to 1875, the exports to England from Mexico in various goods was \$768,411.37; in metals, \$7,612,788.57; and other merchandise, \$838,637.96. Total, \$9,219,873.40. The same to United States: various goods, \$3,476,774.53; in metals, \$6,696,538.55; other merchandise, \$184,854.82. Total, \$10,358,167.80. Total amount of exports in that year was \$27,318,788, of which the United States received \$1,138,294.40 more than England, and over one-third of all the exports of Mexico. The imports from New York City alone in three years and six months amounted to \$3,158,216.48.

The "Boletin de Sociedad Agricola Mexicana," of December 11th, 1880, an official paper, published in Mexico, calculates the amount of exportations for the year 1880, in round numbers, at about \$35,000,000, of which amount the same paper credits the productions of the mines at about \$30,000,000—an increased activity having taken place during the last year—and the balance, or about \$5,000,000, is the value of the other productions exported.

The vast amount of material being imported for the construction of railroads makes it almost impossible to reach a calculation of the probable amount of imports, until all the official reports are returned to the general government, and given to the public, for the past year.

These data are sufficient to encourage our merchants to make an effort to secure this valuable trade, which may be increased almost indefinitely on the development of the vast resources of Mexico.

Duties.

This important subject deserves more than a passing notice, and we might as well state in the beginning that the

heavy duties imposed are a great injury to the commercial progress of the Mexican Republic. Although lumber, machinery, and agricultural implements, and iron and mining tools, with drugs and scientific apparatus, are admitted free—which, to say the least, is a wise provision—and the exportation of ores is also unattended with duties of any kind, yet, in order to raise the revenues of the government, without the taxation of lands or real estate, heavy duties are imposed on almost every article exported from or imported across the border. Goods or agricultural commodities, of whatsoever kind, being shipped from one seaport town to another, no difference if they are natural productions, they are, however, subject to a heavy duty, to be paid at the port of disembarkation, and this revenue is applied to the State and municipal coffers; and foreign goods, having once paid the government import dues at the port of entry, for the towns in the interior, are still subject to an increased inland duty, in case the merchant finds it to his advantage and interest commercially to remove them to other towns and cities.

The home duties and foreign duties, once paid, are redemanded on removal from their original destination, which often discourages inland traders. The interior duty touches every article brought into market for sale, which it becomes necessary to pay, or leave a pledge at La Garita, in Sinaloa, and other ports, just before entering the city. Gold coin or dust coming in to be shipped to foreign ports pays four per cent. and silver coin ten per cent. inland duty.

As an illustration of home duties, the following will suffice: When a dozen of eggs, a chicken, a hen, or any of the gallinaceous tribe, Chili pepper, or vegetables of any kind, or a burro load of charcoal, which is commonly used in all Mexican towns for cooking, are brought into town from the interior or east of the city limits, the vender has to pay a small duty, which goes to the support of the corporation, or town and government, while the rich man, owning thousands of acres of land, cattle, and mines, is scarcely aware of the influence of direct taxation. His lands, or houses, or cattle, or horses, or mules, which he owns by the thousands, are not taxed, while the laboring and industrial classes support the government by direct taxation.

The seaport or foreign duties are much higher than they should be to promote a healthful interchange of commerce, being from fifty to one hundred per cent., and sometimes even higher, on the first cost, on many articles; besides

which some articles, under different administrations, meet with a total prohibition, while others escape free from duty such as we have mentioned. Flour, sugar, coffee, and not unfrequently tea and tobacco, are sometimes entirely prohibited. This is, however, not so now, we believe, as to either of the states of Sonora, Chihuahua, Sinaloa, or Durango.

We simply give the facts without comment, and leave them as we find them. The richer classes bear a portion of this taxation in the consumption of all articles, we might add; and the non-taxation of lands or mines is not without its advantages. These enormous duties and prohibitions have led many times to speculation and malfeasance in the faithful discharge of official obligations, as the extensive importer is sure to banter the custom-house officers, in order to diminish the import duties. This, when resorted to, is arranged as follows:

The consignee appropriates to himself one-half of the custom-house dues; one-fourth goes to the custom-house officers, and one-fourth to the government; and then, to complete the climax of shrewd maneuvering, the consignee charges the whole import duties to the home merchant, or shipper. This, in Mexico, is called "*Yankee Wiring*," or "*Intriga de Estados Unidos*."

The duty has been as high as fifty per cent., or \$500,000 on \$1,000,000 worth of merchandise, which amount, some merchants of the city of Mazatlan have yearly sent to them from Europe to be sold on commission; and it is readily seen that it becomes a great and important object, and more especially to the importer or consignee, to retrench as much as possible this enormous sum flowing into the treasury of the government.

The duties in Mexico are computed by weight mostly; on dry-goods, by the square meter; but other goods not on the list before mentioned are provided for in the tariff at 55 per cent. on appraised value or first-cost price. Quick-silver escapes duty, and the larger part of this article is imported by Mr. Thomas Bell of this city, who is the agent of Barron, Forbes & Company of the City of Mexico, and a member of the firm of Thomas Bell & Company, formerly Barron & Co. The former partner of Mr. Bell was Mr. Barron, who was the nephew of Barron, of Barron, Forbes & Co. The best property of the state of Jalisco belongs to this latter wealthy firm, while they own half the town of Tepic, and other valuable property in the Republic of Mexico. Clothing pays the enormous duty of 132 per cent. The pol-

icy of Mexico generally is a tariff on all goods produced in the republic, and all goods expected to be produced—rather an extreme point for the policy of protection, yet it has resulted in a wonderful development of her industries. There is a very heavy duty on flour. It reaches \$5 per hundred weight, or five cents per pound. The tariff, we thus see, is enormous, and should be much less; but the advance of the locomotive will soon produce a wonderful change. Meanwhile, the trade should not be allowed to lapse on this account.

We add the following data on duties: Dry-goods of the costliest and cheapest grade run from 9 to 22 cents per square meter, while linen goods and more costly fabrics run from 22 to 80 cents per square meter; bar or sheet iron, 6 cents per kilogram; other classes of manufactured iron, 29 cents; stoves with brass ornaments, 29 cents; while the duty on plain stoves and complete utensils is 19 cents. The laws regulating the duties are uniform throughout the republic, although some years past each state passed its own laws, and the consequence was that traders found different duties imposed, according to the locality.

The Trade with Mexico.

This brings us to the subject of trade with the great republic of Mexico. This trade is now mostly in the hands of European capitalists in London, Liverpool, Hamburg and Paris, but a fair proportion also goes to the Eastern cities of the United States. There has been an apathy existing in San Francisco that is hard to explain in regard to this trade, and on consulting with some of the wholesale merchants of this city, we find that the almost universal custom of extending credit in the republic of Mexico, from 60 and 80 days to 6, 12 and 18 months, has induced the capitalists of this city to almost neglect the immense trade lying at their very doors. There are some large commission houses, however, who have found the trade profitable, among which we may mention Cobrera, Roma & Co., W. Loaiza, I. Thannhauser, A. Kœnecke & Co., the Continental Oil Co., which has almost a monopoly in oil, and some others. The length of time demanded for credit has been the principal cause of the apathy existing here, the risk being considered too great to enter upon. Others claim that the completion of the railroad connections East will destroy the trade now existing on this coast outside of California productions, since the

middle-men or commission merchants here will have to order their goods from New York, St. Louis, Chicago and Boston, and then compete with Eastern merchants, from whom they have purchased their goods, for the trade of Mexico.

They claim that Eastern capitalists can lay down their goods at the ports of the republic of Mexico for the same price that they can be purchased and laid down at San Francisco. Thus this trade is cut off; and well knowing the shrewd business tact and knowledge of the merchants of Mexico will lead them to order their goods direct, without the assistance of middle-men, they very naturally decline to enter the field of competition. However, several business houses of San Francisco, in spite of these difficulties, have sent Mr. Chas. W. Sturtevant to Guaymas and Mazatlan in their behalf, to solicit the trade and patronage of Mexico. Among others we may mention the Cutting Packing Co., Jas. R. Kelly & Co., Prescott, Scott & Co., Risdon Iron Works, T. H. Goodman, the Pacific Rolling Mill Co., John Skinker, Main & Winchester, A. G. Hallidie, C. C. Burr & Co., General John F. Miller, Goodyear Rubber Co., Parke & Lacey, Pacific Saw Manufacturing Co., Williams, Diamond & Co., General Rosecrans, and many others.

Quite a number of orders have been already sent, and quite a brisk trade is expected to be opened. Still, we find on reading some of the Mexican papers, that the editorials on this project are fully alive to the actual state of facts, and they are loth to pay a profit to middle-men, when they can avoid it by purchasing direct from Eastern capitalists. The sole competition in the future will be between the actual products of California and those of the East to secure this trade. We hope this will induce our capitalists to enter more into the manufacturing industries that may be built up on this coast, and thus place our state on a level with Eastern manufacturers. This will eventually come, and bring with it the benefits that manufacturing industries always bring.

The foreign merchants resident in the ports of Mazatlan and Guaymas, well knowing the taste of the Mexican people, have goods manufactured especially for the Mexican trade, and thus have secured a footing that other outside traders have not. The influence of these merchants is very great, and they being intelligent, and educated especially for business, and emphatically trained merchants, have monopolized, to a great extent, the trade of this part of Mexico.

They have, in many instances, placed the custom-house officers and governmental authorities under obligations to them, and are on the best of terms with them; hence the difficulty of securing a foothold in the trade of Mexico. The interests of these home merchants is to control the trade, and they can afford to wait for their patrons. The outside merchants demand cash or short credit, and the result is, that the available coin will thus be absorbed by the outside merchants; hence, the result would be a longer time to wait on the part of the home merchants doing a wholesale business in those ports. The natural consequence is, that San Francisco will find the opposition of the German merchants especially to be very serious, and they will have little desire to make purchases of outsiders, or induce their patrons to do so either, against their own interests. This will, however, apply only to goods not obtainable at a profit in competition with California or United States manufactured goods or articles.

When a foreign vessel is about to enter the port of Mazatlan or Guaymas, to land her goods or cargo, a signal is arranged between the vessel and the home merchants. Signaling for them on arrival, the merchants, knowing the amount of duties demanded on the cargo, immediately visit the custom-house officers, and arrange the matter in this manner. The merchant says: "I have a cargo on which the duties are, in a round sum, \$100,000. If you take \$25,000, (or \$30,000, or even a less amount) we will land here. If not, the vessel goes on to Guaymas, (or Mazatlan, as the case may be) and will unload there. Now, what do you say?" The matter is generally arranged satisfactorily.

This is also true, to some extent, in relation to the smuggling in of prohibited articles. When caught, a "dividirse" or "divide" is made, often sharing half and half or less; and in this manner the duties are to some extent evaded.

This was true, however, ten years ago. Official virtue may have improved since then. The vessels have been known to wait outside the harbor for 30, 60, or 80 days; before a satisfactory bargain has been made. We obtain the above data from a reliable source, and give it as the result of inquiries among wholesale merchants of this city.

The proper way to secure this trade, in our opinion, is to secure the friendly co-operation of the German and other foreign merchants in those ports, by building large warehouses in San Francisco and charging but little for storage, so that goods may be placed here to await the sale and pur-

chase of the merchants of those and other ports. The object of this is to compete with the European warehouses of Liverpool, London, and Hamburg. The warehouse system of the United States is defective and needs improvement. Our system should be similar to or better than our foreign competitors', so that the commerce of the United States should be equal at least to that of Europe. Most of the products of England or Germany can be produced in the United States, if proper attention is drawn to it. The balance of trade in many articles of export is already in our favor, and by establishing a large warehouse system we may command a commerce that England or Germany has never enjoyed. The trade with China, India, Mexico, Australia, and Asia may be ours if an effort is made to secure it. Almost all articles of export brought from European Asia into the ports of Mexico come from the warehouses of Liverpool, London, and Hamburg. It seems to us that if the government of the United States were to build government warehouses in San Francisco, New York, Boston, Baltimore, and New Orleans, and rent the various departments to merchants in those cities at a reasonable charge, with no duties imposed on exports as it is now under our laws, the cargoes of vessels could be deposited for reshipment to Mexico and other ports on the reception of orders from every point. The law as it now stands allows vessels to land their cargoes and pay no duties for three years, unless the goods are taken from the warehouse and disposed of within our borders; but if the merchant desires to ship his goods to a foreign port, they are entered as exports and no duty is paid. This is proper, for the goods do not thus compete with home manufactures. But the law might be improved in exempting from duties entirely all goods landed in warehouses or depots for foreign shipment, unless they are disposed of within our borders. For instance, under the present law, when the three years have elapsed the goods have to be reshipped, in order to avoid paying the duties, and again returned for three years more. This incurs an expense that diminishes the profits. If the goods placed thus in warehouses for foreign shipment were exempt as before stated, they might accumulate indefinitely, and thus fill large depots in those ports awaiting orders from all parts of the world. Then if the government were to build these warehouses the rent would soon pay for the outlay, and a revenue would be continually pouring into the national treasury, and the merchants could thus keep their capital invested in goods. This we think is

one of the solutions of the problem of the revival of American commerce. American bottoms would soon be carrying the commerce of the world, and our national wealth accumulating, until the head-lights of our steamers carrying the national flag would be seen on all the high seas and in every port. The condition of our foreign commerce plainly indicates that something should be done, and we only offer the above suggestions and hope if they have any value that our commerce may be profited by them. We should like to see a bill presented in Congress to that effect, and hope that the experiment will be made as we have indicated; or some other equally as good, if not better.

The Trade of San Francisco with Mexico and Central America.

The following we obtain from the *Journal of Commerce* of this city of January 27th, last:

Our exports to Mexico have not increased for years. With Central America they have increased very largely—the reason being that we take the products of Central America and market them, and sell her our products in return.

Exports of domestic goods for a series of years have been as follows:

	Mexico.	Cent. America.
1874.....	\$1,006,328 00	.....
1875.....	1,077,286 00	.....
1876.....	1,012,554 00	.....
1877.....	1,304,767 00	.....
1878.....	1,624,241 00	\$1,079,277 00
1879.....	1,308,075 00	1,092,649 00
1880.....	1,704,140 00	1,060,806 00

San Francisco trade with these countries consists principally in the import of coffees, sugars, cochineal, cocoas, salt hides, etc., and the export of miscellaneous goods.

Our imports from Mexico and Central America for a series of years have been as follows:

	Mexico.	Cent. Amer. States.
1874.....	\$4,198,214	\$2,416,556
1875.....	4,027,570	1,826,688
1876.....	5,033,628	1,612,494
1877.....	4,863,077	2,639,516
1878.....	4,526,136	2,884,223
1879.....	3,905,716	2,049,239
1880.....	4,739,767	2,622,174

The imports from Mexico have consisted mainly of coin and bullion—the following giving the figures of imports of coin and bullion for the undermentioned years:

1874.....	\$3,774,347
1875.....	3,647,607
1876.....	4,686,663
1878.....	4,108,198
1879.....	3,667,299
1880.....	4,379,054

The balance is made up of hides, salt from Carmen Island and fruit. The orchilla for shipment in transit to Great Britain is not taken into account. We occasionally get a little sugar and coffee, but of no great value or importance.

The imports from Central America are made up principally of coffee, sugar and cochineal, with a little treasure.

The trade of San Francisco with those countries will, in the future, show a much greater development than it has in the past.

Traveling in Mexico.

There are but few roads for stages in the whole republic of Mexico, and these only connect with the principal cities, besides the railroads now running. Hence, most of the traveling is done on the backs of mules or horses; the former being preferred on account of their endurance, as the rides are all of long distances. During the hot months, from May to August, the day's travel is commenced before day-break, and continued until 12 or 1 o'clock, when a shelter can be found from the blistering heat. No stoppages are made on the road, generally, unless stopping places are located for that purpose; and the whole day's travel is ended by 1 o'clock, when the animals are baited, either with food, and also with water, which are carried over many routes, or else the animals are staked out with ropes tied to a stake driven in the ground. Rest and food are in order until the next day's travel, (long before daylight) is commenced. Mules or donkeys carry almost everything while traveling away from the stage roads; and often on these, long caravans of heavily-laden animals are seen.

A complete kit for camping is always carried on trips into the mountains; and every one goes armed for emergencies. On the public highways comparative safety reigns; but it is always safer to travel in companies, and not forget the American's pocket protector. Small bands of savages, most-

ly Apaches, still rove in the mountains and over the plains occasionally, and are ready to commit murder and robbery. Brigandage is not entirely done away with; and if the traveler is alone, he must, in dangerous places, keep on the lookout for lurking savages or brigands. Sometimes a solitary brigand will not hesitate to attack a traveler, and the manner of attack is often very singular. As a case in point, a traveler is responsible for the following. While traveling along one of the highways in northern Sonora, he was startled by the "click" of a horse's hoofs behind him, and the peculiar "swish" through the air of a lariat, which fell over his shoulders; and before he knew it almost, his arms were pinioned to his sides. Fortunately, he had the presence of mind to turn his horse's head, being well mounted, and spur his horse in pursuit of the brigand, or he would have been unhorsed in an instant. It took but a moment to free himself from the lariat and draw his pistol and shoot the brigand dead on the spot. The object was to drag him from his horse and over the ground until he was insensible, and then rob him, and possibly murder him. We give this only as an illustration of the perils of solitary traveling. Camping out is often romantic, and very agreeable; but if one intends to travel in Mexico at present, he must expect to endure some hardships. It is necessary to acquire the Spanish language, or sufficient to converse readily, and also to be provided with letters of introduction, either from some well-known Mexican citizen, or foreigner located in Mexico, in order to avoid many unpleasant and aggravating occurrences. The people are hospitable and courteous, and expect foreigners to respect their institutions, and reserve their comments on the government and politics to themselves.

Revolutions.

The disturbances and overthrow of the civil authorities were, at one time, quite serious affairs in Mexico. Small bands of robbers would enter the town, take possession, and levy a tribute on all the citizens. This style of robbery has been dignified with the name of revolution, when it is nothing more than the pranks of highwaymen. The most of these revolutions, so-called, are this and nothing more. Some years ago another style of revolution was adopted, that savored more of a conspiracy to defraud the government than anything else. Some of the large business houses, on the approach of their vessels laden with cargoes would pay

a small band of ruffians to put up a disturbance and overthrow the civil authorities, often in collusion with them, until the vessel had landed her cargo and the goods were stored away; in this manner evading the duties. Some of the oldest and most respectable business houses have often engaged in this revolutionary fraud, and acquired immense wealth thereby. This was stopped about seven years ago by the severity of the general government in ferreting out and punishing the perpetrators. Restitution was demanded in one instance, that cost the firm \$150,000 more than they had ever made by it. This severity was exercised in other instances, and it put a stop to this species of speculation. In some instances during these disturbances, to give color to their innocence, a compromise was effected with the custom-house officers, and about one-fourth of the legal duties were paid. The prompt and effective punishment of this class of offenders by the late governors and chief executives of the republic has stopped the most of this marauding, and the republic is now comparatively safe for travelers and settlers. Foreigners who do not mix in political discussions or squabbles, and keep a close mouth in relation to the affairs of the republic or states, are mostly left undisturbed, as their presence is recognized as desirable.

From the sentiments expressed in the editorials of the Mexican press, we gather the fact that immigration is desired on the part of the Mexican people, and they are opening their hospitable doors to the immense number of immigrants that are now flocking over the border-lines of the frontier. The old fashioned immigrant wagons are again seen on the road, crossing the frontier at El Paso, and remind old "49-ers" of the early days of California. Capitalists are flocking by the hundreds from all parts of the United States into Tucson, and from thence into Mexico; also, at El Paso. These four states are fast being settled by these immigrants, and yet there is room in all that vast expanse of territory for the miner, settler, and capitalist.

One great advantage, besides numerous others, will be in the effective stopping of every class of marauding revolutions; while the country will be settled up, new mines will be opened, and abandoned haciendas be made to pay rich returns for their management. Mexico will be the gainer in numerous ways; her soil will be extensively cultivated, and her mines produce an enormous annual revenue; her towns will be more flourishing, and her exports consequently increased. This will again benefit the nations who may be

in commercial relations with her inhabitants. The more producing element to develop her vast resources, the more extensive her trade with foreign nations will become. There are yet some facts to be taken into serious consideration in relation to the settlement of Mexican territory by American citizens, that will be particularly referred to hereafter in the question of the acquisition of property in any of the states of Mexico by aliens.

Annexation.

In order to disabuse the minds of some persons who may think that any of the northern states of Mexico will at an early period be annexed to the United States, we present the following facts. There is a strong feeling among the Mexican people akin to patriotism, which very positively declares that not another inch of the territory of the Moctezumas shall be ceded to the United States or any other power. This is not the only reason that exists unfavorable to annexation; there are others of importance, the principal one being that capitalists who reside in the United States and Europe who have invested in mines and lands in Mexico will be opposed to annexation, since their property under the laws of Mexico escapes free from taxation, and their influence will be against it. Secondly, the large property owners in these four states for the same reason will be opposed to it. Thirdly, a large element in the United States, located mostly in the South, who cultivate, in common with Mexico, cotton and sugar-cane and other productions of the tropics, are opposed to it. Also, the additional federal taxes to support the governments in the additional territory, should it be annexed, makes the scheme an expensive one; besides the enormous price that would be demanded by the Mexican government for this territory, which contains the richest mines in the republic, would present an additional obstacle. Again, the advantages received would not repay the enormous outlay that would add to our already overburdened national government debt. Lastly, the cultivation of friendly business interests and relations between the two republics will reduce the duties, so that when iron bands have joined their commerce, friendly and mutual interchanges will banish the idea of annexation. We think the advantages will be the same, but without the disadvantages that would be necessarily incurred.

The influx of immigration will add to the security of

property and person, which is all that settlers in a foreign country generally desire. Mexico is a great nation, and is well known to be the richest nation in the world in mineral resources. If they are developed by intelligent and well-directed labor, her future is a brilliant one. The telegraph and railway are already carrying into her limits the advantages that will make her one of the most powerful nations on the globe.

Steam engines are plying in her gold and silver mines, imported by foreign capital. Soon her seaports will be thrown open on both sides, and she will command the commerce of the world. Far be it from the American people to covet her vast territory, with all her riches, though undeveloped they be. Rather let us extend to her a friendly hand, assisting her to take a place among the advanced nations of the earth, with liberty inscribed on her flag, and prosperity extending throughout her limits.

Her form of government is Republican, let us remember; and she too, with our own republic, is solving the question of self-government. Stormy though her career has been, yet, with all her revolutions she has claims still upon our friendly interest; and with a commendable spirit of patriotism she is attempting to educate her people and develop her vast resources under a Republican form of government.

As Americans love their soil and take pride in their institutions, so does Mexico, in like manner, believe in her nation, her people, and looks forward to an era of prosperity equal to any nation on earth.

For centuries she has been bowed down under the weight of an antiquated despotism, and is but passing through her childhood as a republic. With the fall of Napoleon, in France, Mexico awoke to put off the shackles of her Spanish conquerors. Hernando Cortez found her a half barbaric but magnificent empire, ruled by the native princes, who wielded a despotic power in the palaces of the Moctezumas. Spain left her a ruined empire, with half of her people without the aid of the basis of modern civilization.

Ignorance spread its pall upon her future as a republic, and storms of revolution after revolution was the natural result. But a new era is now dawning, that gives the promise of a magnificent future. She is favorably situated for commerce—perhaps more favorably than any other country in the world; for she touches two oceans and a hundred islands, and stands midway between North and South

America, and midway between all the commerce of Asia and Europe. We boast of our mines in California, Nevada, and the territories, when we have but the border of the vast mineral region that nestles in her bosom. She possesses the matrix of all our mines of gold, and silver, and copper, and other minerals, while we have but the outcroppings. Her mines have for centuries yielded vast riches, and are almost untouched in comparison with her hidden treasures that are yet to be developed. It is no wonder that capitalists are turning their eyes upon Mexico from all parts of the world. England, and Germany, and France have for years been quietly gathering the flower of her commerce; and even now the parties interested in Mexico from these nations are attempting to discourage American capitalists from invading their special favored commercial territory, as they are pleased to term it: but although they denounce the Mexican government and people, they take care to continue their quiet absorption of her wealth. It is time American capitalists should be vigilant; and if any nation is to develop the vast resources of Mexico, and profit thereby, the energetic American people are to contribute their share in this great and remunerative work.

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ARIZONA, NEW MEXICO AND TEXAS.

STAGE CONNECTIONS.

FROM	To	MILES.	FARE.
Maricopa....	Phoenix..... <i>Daily</i>	28	\$ 5 00
	Prescott..... "	150	25 00
Casa Grande..	Florence..... <i>Daily</i>	30	5 00
	Pinal..... "	62	9 00
	Riverside..... "	66	10 00
	Silver King... "	67	10 00
	Globe City... "	126	20 00
Tucson	San Xavier..... <i>Daily,</i>	7	1 50
	Arivaca.... " <i>Sundays Ex.</i>	70	6 00
	Oro Blanco. " "	76	7 00
	Tubac..... <i>Tuesdays</i>	60	5 00
	Magdalena. " " <i>& Saturd'ys</i>	135	10 00
	Hermosillo. " "	275	18 00
	Guaymas... <i>Tuesdays</i>	370	26 00
	Altar..... <i>Mondays</i>	160	10 00
	Guaymas via Altar "	430	30 00
Pantano	Harshaw..... <i>Daily</i>	42	6 00
	Patagonia..... "	42	6 00
	Washington .. "	51	7 50
Benson	Contention Cy. <i>Daily</i>	22	4 00
	Tombstone.... "	31	4 00
Lordsburg....	Silver City.... <i>Daily</i>	55	8 75
Deming.....	Ft. Cummings. <i>Daily</i>	18	4 00
	Terminal A., T. & S. F.		
	R. R., via Cumming	40	8 00
	Mesilla, via Cumming <i>Daily</i>	80	12 00
	El Paso, via Mesilla "	130	19 50
El Paso.....	San Antonio	500	.....
	Eastland	450	.....
	(TEXAS & PACIFIC RY.)		

THE LOOP.

THE only Railroad Engineering Work of this nature where THE ROAD IS MADE TO CROSS ITSELF. It is located midway between KEENE and GIRARD, 352 miles from San Francisco. Length of Loop, 3795 feet. Elevations: lower, at Tunnel 9, 2956 feet; upper, at grade over Tunnel 9, 3034 feet Difference in elevations, 78 feet.

The SAN FERNANDO TUNNEL is 6967 feet in length, being one of the longest railroad tunnels in America. It is between NEWHALL and SAN FERNANDO, 456 miles from San Francisco, and 26 miles from Los Angeles.

The S. P. R. R., two miles west of Iulio, passes below the Level of the Sea, and continues below it for 61 miles thence eastward, the greatest depth reached being 366 feet.



THE Southern Pacific

RAILROAD COMPANIES

OF

ARIZONA NEW MEXICO

TAKE pleasure in announcing the opening for traffic of the SOUTHERN OVERLAND ROUTE to the new, temporary, Terminal Station at

Deming, 1208 New Mexico.

Miles from San Francisco

Giving an unbroken ALL-RAIL LINE from Eastern and Southern Cities via Council Bluffs, Ogden, Lathrop, Los Angeles and Yuma.

LOCAL TIME-SCHEDULE,

Leaving San Francisco.

ARIZONA EXPRESS.

4.00 P. M. Daily—Via Oakland and Martinez, for Lathrop (Stockton and Galt), Merced, Madera (Yosemite and Big Trees), Visalia, Summer, Mojave, Newhall (San Buenaventura and Santa Barbara), Los Angeles, Santa Monica, Wilmington, Santa Ana (San Diego), Colton and Yuma (Colorado River Steamers), connecting direct with Daily Trains of the Southern Pacific Railroad of Arizona for Maricopa (Stages for Phoenix and Prescott), Casa Grande (Stages for Florence), Tucson (Stages for Guaymas and Sonora), Pantano (Stages for Patagonia), Benson (Stages for Tombstone), and for Deming, 1208 miles from San Francisco, (Stages for New Mexico and Texas.)

SLEEPING CARS

Between Oakland, Los Angeles, Yuma, and Benson.

THIRD-CLASS TRAIN.

5.00 P. M. Daily—Via Oakland, Martinez and Lathrop, for Los Angeles, Yuma and points in Arizona and New Mexico.

Arrive LOS ANGELES	Arrive YUMA	Arrive TUCSON	Arrive BENSON
2nd Day. 6.05 P. M.	4th Day. 7.00 A. M.	4th Day. 11.55 P. M.	5th Day. 4.00 A. M.

LOCAL TICKET RATES.

BETWEEN	UNLIMITED FIRST-CLASS allowing Stop-over Privileges.	LIMITED FIRST-CLASS. Round Trip.	LIMITED SECOND-CLASS good on Express Trains.	LIMITED THIRD-CLASS. good on Mixed Trains.
SAN FRANCISCO OR SACRAMENTO AND				
Los Angeles..... (482)	23.00	34.00	18.00	12.00
Santa Barbara..... (562)	30.00			
Yuma..... (731)	45.00		35.00	25.00
Maricopa..... (887)	60.00	108.00	50.00	40.00
Tucson..... (978)	69.00	126.00	59.00	49.00
Benson..... (1024)	73.00	135.00	63.00	53.00
Gage..... (1178)	89.00			
Deming..... (1208)	92.00			

1-30 Days. 4-30 Days.

LIMITED FIRST-CLASS.

San Francisco to Santa Barbara.....\$25.00

UNLIMITED FIRST-CLASS.

Los Angeles and Yuma.....	\$22.00
Los Angeles and Maricopa.....	37.00
Los Angeles and Tucson.....	46.00
Los Angeles and Pantano.....	48.80
Los Angeles and Benson.....	50.60
Los Angeles and Gage.....	66.00
Los Angeles and Deming.....	69.00

Children under 12 years, Half-Fare. Under 5 years, Free.

SLEEPING CARS

Between San Francisco, Los Angeles and Benson.

RATES PER BERNH.	
Between San Francisco and Los Angeles.....	\$2.50
" " " Yuma.....	5.00
" " " Benson.....	7.50

Central Pacific Railroad.

December 15th, 1880.

Arizona Express.	Miles from S. P.	Ariz. Express.
4.00 P. M.	4	12.35 P. M.
4.20 A.	4	12.10 P. M.
8.25 P. M.	94	8.30 A. M.
10.5	103	7.54
8.57	108	7.46
9.14	114	7.28
9.45	127	6.55
10.59	152	5.59
11.14	162	5.15
11.19 P. M.	178	4.34
12.10 A. M.	185	4.15
12.17	188	4.08
1.02	207	4.20
1.59	227	4.30
2.10	235	2.10
2.25 A. M.	341	1.55 A. M.

Southern Pacific Railroad.

Ariz. Express.	Miles from S. P.	Ariz. Express.
2.25 A. M.	241	1.55 A. M.
2.55	251	1.27
3.30	302	12.55
4.08	282	12.04 A. M.
5.25	314	10.43 P. M.
6.35	336	9.30
7.37	350	8.25
8.30	362	
9.50	382	7.30
10.45	406	6.15
11.50 A. M.	431	4.55
12.10 P. M.	480	3.50
12.40	452	3.15
12.55	456	2.45
1.10	461	2.20
1.55 P. M.	482	2.00
2.25 P. M.	482	1.15 P. M.
3.10	491	
3.30	494	10.15 A. M.
3.30	495	9.40
4.00	496	9.30
4.45	511	9.25
5.05	515	9.00
5.24	524	8.30
7.10	540	7.50
7.50	543	7.20
9.10	563	6.55
9.25	569	6.40
10.40 P. M.	582	6.25
12.15 A. M.	612	5.55
1.10	642	5.30
1.50	623	5.15
7.00 A. M.	731	4.55 A. M.

SOUTHERN PACIFIC R. R. OF ARIZONA

SOUTHERN PACIFIC R. R. OF NEW MEXICO.

Ariz. Express.	Miles from S. P.	Ariz. Express.
7.45 A. M.	731	6.00 P. M.
8.44	747	5.10
9.40 A. M.	762	4.30 P. M.
3.28 P. M.	859	10.55 A. M.
6.05	878	8.45
7.45	914	7.10
11.55 P. M.	937	3.10 A. M.
12.50 A. M.	978	
2.52	1006	2.55 A. M.
4.00	1024	12.35 P. M.
7.23	1064	11.25 P. M.
10.33	1104	5.55
11.15	1175	
11.58	1188	1.05 P. M.
3.55	1175	1.00 P. M.
6.00 P. M.	1208	

ARIZONA, NEW MEXICO AND TEXAS.

STAGE CONNECTIONS.

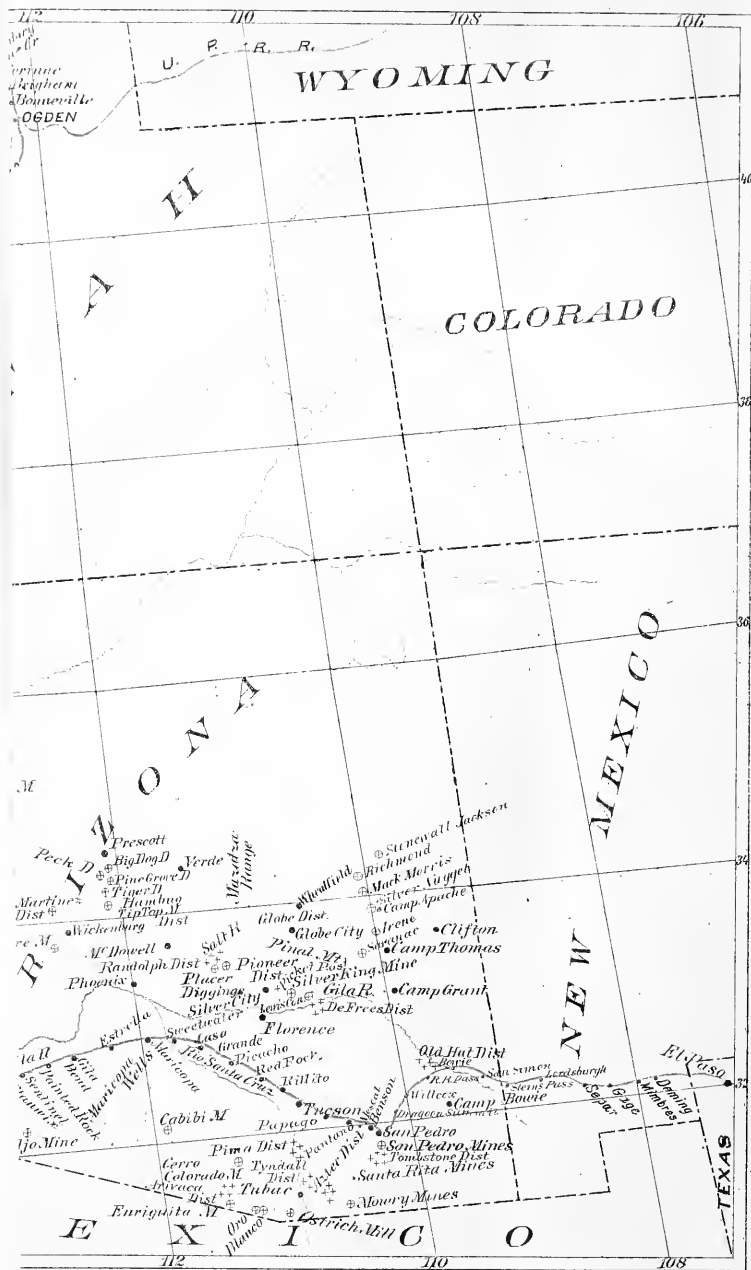
FROM	TO	MILES.	FARE.
Maricopa.....	Phoenix..... Daily Prescott.....	28 150	\$ 5 00 25 00
Casa Grande.....	Florence..... Daily Pinal..... Riverside..... Silver King..... Globe City.....	30 62 66 67 126	5 00 9 00 10 00 10 00 20 00
Tucson.....	Sun Xavier..... Daily Arivaca..... Oro Blanco.....	7 70 76	1 50 6 00 7 00
	Tubac..... Magdalena..... Hermosillo..... Guaymas..... Tuesdays	60 135 275 370	5 00 10 00 18 00 26 00
	Altar..... Mondays Guaymas via Altar.....	160 430	10 00 30 00
Pantano.....	Harshaw..... Daily Patagonia..... Washington.....	42 42 51	6 00 6 00 7 50
Benson.....	Contention City..... Daily Tombstone.....	22 31	4 00 4 00
Lordsburg.....	Silver City..... Daily	55	8 75
Deming.....	Ft. Cummings..... Daily Terminal A., T. & S. F. R. R., via Cumming	18 40	4 00 8 00
	Mezilla, via Cumming..... Daily El Paso, via Mezilla.....	80 190	12 00 19 50
El Paso.....	San Antonio..... Eastland..... (TEXAS & PACIFIC RY.)	500 450	..........

THE LOOP

THE only Railroad Engineering Work of this nature where the road is made to cross rivers. It is located midway between Ketchikan and Graham, 352 miles from San Francisco. Length of Loop, 3785 feet. Elevations: lower, at Tunnel 9, 2156 feet; upper, at grade over Tunnel 9, 3034 feet. Difference in elevations, 878 feet.

The SAN FERNANDO TUNNEL is 6907 feet in length, being one of the longest railroad tunnels in America. It is between Nientall and Santa Fe, 456 miles from San Francisco, and 20 miles from Los Angeles.

The S. P. R. R., two miles west of Olin, passes below the Level of the Sea, and continues below it for 11 miles thence eastward, the greatest depth reached being 550 feet.

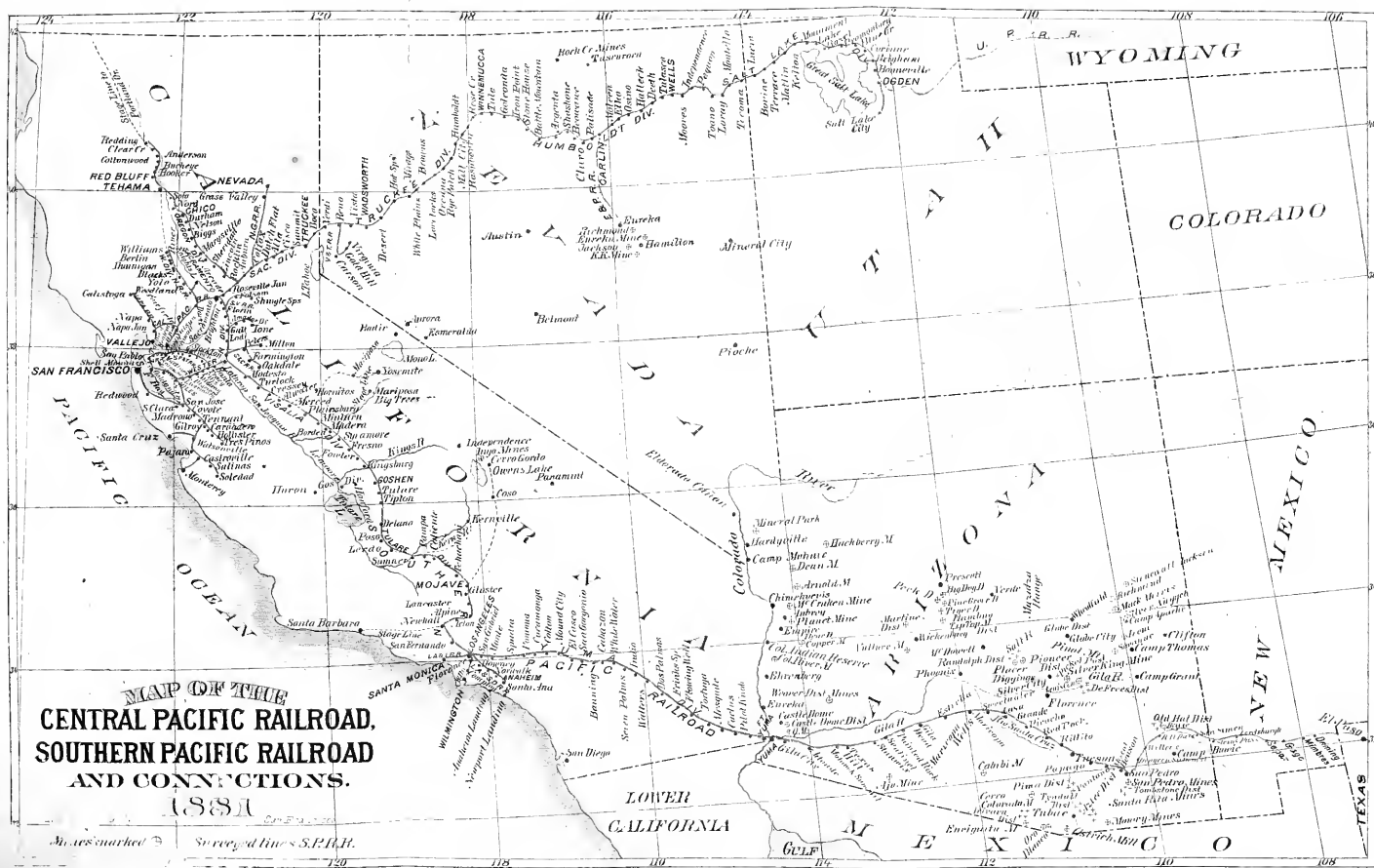


APPENDIX.

Railroads.

The *Diario Oficial* of Mexico has lately published the contracts or concessions made by the General Government with the several railroad companies for the construction of railways through the different parts of the Republic, which, in substance, are as follows: The celebrated enterprise of Señor Simon and Señor Sullivan is called the "Ferrocarril Central Mexicano," or Central Mexican Railroad. This line is to be constructed from the city of Mexico through the State of Leon, by way of Queretaro, Celaya, Salamanca, Irapuato, Guanajuato, and Silao. From Leon it will continue north to the Paso del Norte on the Rio Grande, through the States of Aguas Calientes, Zacatecas, Durango, and Chihuahua. This enterprise of Sullivan will also have terminating lines at Manzanillo and Natividad, passing Toluca, Maravatio, Acambaro, Morelia, La Piedad, and Zamora, to points on the Pacific between Morelia and Maravatio, touching San Luis, Saltillo, and Monterey, as far as Laredo Pass of Aguilla, in the State of Tamaulipas, on the Rio Grande, about 150 miles from the mouth. The general termination of these lines on the Rio Grande is uncertain. The friendly tone of the message of the President of the Republic on this enterprise shows a desire to add further concessions, until the roads will ultimately reach from Tepic to Rosario, Mazatlan, and Culiacan by way of Corala in Sinaloa. In the State of Chiapas a road is to be constructed in the direction of Guatemala. In the States of Hidalgo, Yucatan, Tlaxcala, Vera Cruz, Puebla, Oaxaca, Sinaloa, Michoacan, Chihuahua, Guerrero, and Tamaulipas, concessions have been made by the General Government to each respectively, to build railroads in those States. The different concessions of the Government, made to diverse railroad companies, embrace the Mexican Central, before mentioned, and another line to the Pacific, passing through Guadalajara, and through Jalisco; another by way of Toluca, Morelia, and Zamora, with the stipulation that this line is to reach the northern frontier, passing through the cities of San Luis, Saltillo, and Monterey; with many others. And lastly, the Sonora Railroad, from Guaymas to Hermosillo, and thence north to the frontier, connecting either at El Paso, or near there, with the Southern Pacific or A. T. & S. F. R. R., by way of Ures, on the Sonora River. If it connects at El Paso, or near that point, instead of Tucson, it will pass along the Sonora River by way of Ures, Arispe, and Santa Cruz.

On the 28th of December last, subscription was opened in New York for \$7,500,000 in bonds, and the same amount of stock, of the Mexican National Railway—\$5,500,000 having been already subscribed—to build the main international line embraced in the Palmer-Sullivan concession from the Mexican government. The stock of this company is owned by a New York company, and connected with the railroad interests of Thomas Scott. The one from Vera Cruz to Mexico is owned by a company in London, and is now running; with many others. These grants thus open the way for the inter-oceanic railway at Tehuantepec, the line from Guaymas to the United States frontier, and two leading trunk lines which are to establish communication between the Mexican capital and the American system, with two branches to the Pacific. Thus we will soon be in direct communication with all this vast territory lying south of the United States. The *Daily Journal of Commerce* of this city thus comments on these facts, in an issue of January last: "Such an event will be of incalculable importance to both countries. It will establish more closely the ties that should unite sister republics, open up new lines of trade and commerce, and develop in Mexico a commercial





prosperity and growth unparalleled in all her former history. The benefits to the United States will also be large and increasing. A new outlet will be furnished their manufacturing industries, a new market for their merchants, and a new demand for their crops. If no serious obstacles are put in the way of the companies constructing the lines to the American frontier, it will not be five years before connection is made with the United States' vast network of railroads, and direct communication established by rail from New York to the City of Mexico."

Captain James B. Eads and party of engineers, composed of Messrs. Griffin, Corthell and Williams, left for the Isthmus of Tehuantepec on the 23rd instant, on a survey for his great ship railroad.

From a telegram appearing in the *Evening Post* of this city, from St. Louis, dated January 6th, it appears that the Mexican Central Railroad has purchased a site for their depot, shops, etc., at El Paso, securing 100 acres for that purpose. Colonel Nut, the agent, says engineers are now in the field surveying a line to Chihuahua, thence to the City of Mexico; and track laying, south of El Paso, will probably commence by April 1st, or as soon as the Atchison, Topeka and Santa Fé road reaches that point. Thus, it appears the great republic of the south will soon be in communication by railroads in every part of her vast territory with the United States. Besides these railroads, Mexico city is already in communication with Vera Cruz and many other points by railroad and telegraph lines. The latter always are stipulated for in each concession; in some instances, telephones also. Alamos, in Sonora, is in communication with the principal mines in the vicinity by telephone. Hermosillo communicated with Guaymas by telegraph on January 7th, last.

Steamship Lines.

Besides the stages that run from Santa Fé, in New Mexico, and Tucson, to northern Sonora, as well as the cavalcades and wagon trains that are continually passing over the highway from El Paso to Chihuahua, there are many steamship lines from New York and New Orleans, touching at Vera Cruz. Also a line of steamers, run by the Mexican Steamship Company, from Mazatlan to San Francisco, touching at La Paz and other ports; the fare to Mazatlan being only \$75, including meals, berth, &c. The same steamers also pass up the Gulf of California to the port of Guaymas, and one steamer lately built, owned by Mr. Andrade, also goes up the Gulf to the port of La Libertad and other points, and we understand will eventually establish a connection with the mouth of the Colorado River. From the *Diario Oficial* we obtain the following:

"The Executive has passed a contract with the Morgan, Louisiana and Texas Steamship Company. In virtue thereof, said Company engage themselves to establish a line of steamers to ply between Morgan City and the port of Vera Cruz. The steamers are to touch, both on coming and going, at Galveston, and are to perform two or three round trips monthly. The Company are to receive a subsidy of \$300 per round trip, and take the engagement of carrying the public and official correspondence for all the intermediate ports touched at by said steamers.

"Another contract has also been passed with a Californian company of steamers, modifying the one which had existed hitherto, and this on more favorable terms for the public treasury. In virtue of this contract the steamer "Newbern" will make monthly trips between the ports of Mazatlan, Sinaloa and San Francisco, (California) touching both coming and going at the Mexican ports of Guaymas, La Paz, Cape San Lucas and Magdalena Bay. The communication between these important Pacific ports has thus been regularly organized, an advantage which will more than compensate the expenditure of \$1800, which are to be paid to that company as a subsidy for each round trip.

"In speaking of mail steamers we must here state that there exists besides another line that renders important services to the maritime traffic of the Gulf—the one of the Messrs. Alexandre and Sons, of New York, whose steamers make weekly trips, in those months that the quarantine laws allow them, from New York to Vera Cruz, touching at Frontera, Campeachy, Progreso and Havana, and from New Orleans to Vera Cruz, touching at Tuxpam, Tampico and Matamoros every three weeks."

Besides these contracts with mail steamers, the President of the Republic "is also making efforts for the establishment of a national bank. To sum up: Mexico has already entered into a path of true progress, giving a palmy proof of the same with the earnestness of her children, for the constructing of great railway lines which are to thoroughly change the country, and with the realization of every material improvement."

Restrictive Laws Against American Citizens, and the Remedy.

Before investing in real estate in any of the border States of Mexico, a matter of first importance is to see that the Mexican Government repeals all laws and decrees of prohibition against the acquisition of this class of property by American citizens. A treaty should also be entered into with the Mexican Government by the United States for the protection of American capitalists, prohibiting the passage of any or all laws against the title to property, personal or real estate, and mines of American citizens located within the boundaries of the Mexican Republic. This treaty should be broad, and apply either to American citizens residing in Mexico, or in the United States, or in foreign lands.

The direct cause of the existence of these laws, which we shall publish in a separate pamphlet, is the fear of the Republic of Mexico losing portions of her territory. This, however, could be obviated by inserting a clause in the proposed treaty, protecting the Mexican Republic from the loss of any portion of her territory through the acts of American citizens or foreigners crossing from our borders. A clause should also be inserted against annexation of any portion of her territory to the United States, either in rebellion against the General Government, or by the consent of any of the States, without the consent of the Republic of Mexico. Such a treaty, solemnly entered into between the two nations, would be supreme in its binding effects, and an adequate protection would then be extended to American citizens who might invest capital in Mexico, and an equal and adequate protection to the Mexican Government. Our present treaty is very defective and should be amended. Its principal objection is the effect of the loss of citizenship upon titles to real estate granted by either Government to citizens of the opposite nation. This we offer as a suggestion, and call especial attention to it, on account of the large amount of capital of American citizens that has been and is now being invested in Mexico.

This important subject should not be overlooked by those of our fellow-citizens who desire to invest their capital in the Mexican Republic. There has been, and is now an erroneous opinion prevailing that all laws of restriction have been repealed, and that a good and valid title to real estate may be obtained by purchase from Mexican citizens: *but this is not true, unless all the laws are complied with by the purchaser.*

Thus we see the necessity of the repeal of all laws of this character, and a treaty entered into and ratified as soon as possible, as before mentioned. In fact, we are assured by responsible Mexican citizens that some degree of alarm is already spreading in Mexico in view of the large emigration crossing the borders into her territory; and the next Mexican Congress, which convenes on April 15th next, will adopt prompt measures for the protection of the republic. It will be of the utmost importance, therefore, for the present owners of property in Mexico to push this matter before the two Governments as soon as it may be done, and secure themselves by an additional clause in both the repeal laws and proposed treaty, (should such a treaty be entered into) in order to avoid future trouble and possible loss of all their investments. The whole matter can be arranged satisfactorily, if attended to promptly and properly without undue haste on the part of either nation. Vast interests are involved that will require careful management, and the exercise of clear-headed judgment, free from all bias or prejudice, as well as directed by wise statesmanship.

Citizens of both nations should be at liberty to acquire real estate within the limits of each territory, without hindrance by either power,

and without hazarding any portion of the territory of either republic. This will become necessary in order to develop our mutual commercial interests. There should be no hesitancy on the part of either nation to accomplish this, for upon it will depend, in a great measure, all future commercial as well as friendly relations between the United States and Mexico.

Americans should abandon all Utopian and fanciful dreams concerning the manifest destiny of the republic, and place our nation upon a substantial commercial basis in our intercourse with foreign powers.

In order that our readers may see for themselves the laws that now exist, which reveal the true policy of Mexico, we shall publish shortly a portion of the Appendix in a pamphlet, separately, containing those portions of the prohibitory laws directly applicable to American citizens, in both Spanish and English. The greater part of these laws have never before been translated into English, thereby causing the serious blunder made by many American capitalists, who looked more upon the opportunity for profitable investment than calculating upon, or even without knowing, the risk involved. Others have taken desperate chances, well knowing the result if Mexico chooses to adopt a course opposed to their interests. Others again have imagined that all these laws were unconstitutional, and a decision of the Supreme Court of Mexico would satisfactorily settle the whole matter; but I am assured, from a reliable Mexican source, that the policy of Mexico—which she has been forced to adopt since the experience of the Texas acquisition by the United States—will compel her to strain the Constitution, if necessary, to protect her territory on the ground of public policy, if no other means of relief is presented. Besides, such a decision is attended with an enormous expense, and would only benefit the parties to the suit.

The Constitution of the Republic was adopted February 5th, 1857, and repealed all former laws contrary to its provisions. But whether its provisions effect the restrictive laws before mentioned, is a question susceptible of considerable doubt, from the fact that these restrictive laws were passed as measures of public policy, and are not repealed by any express terms of the Constitution. By referring to those portions of the Constitution before mentioned, it will be seen that a distinction is very broadly drawn between Mexican and naturalized citizens of the Republic, and foreigners; but does not, in any manner, extend the privileges of foreigners beyond the rights contained and set forth in Section III, Article 30, Title I, which guarantees to them the rights established by Section I, Title I, viz: "Every man is free to adopt such a profession or industrial pursuit as he may prefer, the same being useful and honest, and to enjoy the products thereof, etc." "Nor shall any one be hindered in the exercise of such profession, etc., unless by judicial sentence, when the same prejudices the rights of a third person, or by executive order dictated in terms prescribed by law, in case the same offends the rights of society."

Look at it as we may, the whole proviso rests upon "the rights of society," or public policy. What are those rights? The Mexican Government possesses the exclusive prerogative to determine those rights. Protection of those rights is a matter of public policy, which is paramount to the rights of individuals. Hence, under these restrictions, providing they are unrepealed, no Mexican citizen—without taking into account the rights of foreigners—has a right to complain because he cannot dispose of his property to aliens, who do not comply with the laws provided for under the Constitution, nor to that class of aliens not contemplated therein. Nor does the Constitution bestow upon him a right to "*offend the rights of society*," by entering into business relations that are contrary to public policy.

Then, after drawing the distinction clearly between the rights of foreigners and the rights of citizens of the Republic, native or naturalized, no clause is found that gives to the foreigner any other privileges than are bestowed upon Mexican citizens or foreigners under the laws adopted in accordance with the Constitution. Measures of public policy are undoubtedly referred to in Section I, Title I, of the Constitution heretofore mentioned. Its guaranties are thus modified and restrained by all laws adopted as measures of public policy. That this is the general acceptance of the meaning of the terms of the Constitution appears from all the subse-

quent laws passed by the Mexican Congress, and also from the very important fact that no decisions are extant contrary to the foregoing. But this is not all. The law of the 20th of July, 1863, was cited as law by the report of June 17th, 1875, of the R. R. Commissioners on the Sonora R. R. This law prohibits citizens, native or naturalized, of the nations bordering on the Republic from ever acquiring, by any title whatever, vacant or public lands in any of the States bordering upon those nations, and more especially the lands included in the territory of Lower California, and the States of Sonora, Chihuahua, Coahuila, New Leon and Tamaulipas. If this is a measure of public policy, then indeed is there no right guaranteed to foreigners desiring to settle within the limits of the aforementioned territory and States, for the purpose of engaging in the pursuits and industries of agriculture and stock-raising, for they are prohibited from ever acquiring a title to public or unoccupied lands in any of the border States and territory, under a law passed by virtue of Fraction 24 of Article 72 of the Federal Constitution.

Thus, either the Constitution does not give them this guaranty of entering into those pursuits and industries, on the ground of public policy, or else the law of July 20th, 1863, is unconstitutional. That such a law was anticipated in the meaning of the Constitution, appears from Section I, Title I, and the Fraction 24 of Article 72. This, however, applies, we are told, only to vacant or unoccupied public lands. But this is open to much doubt, from the fact that it applies also to the lands owned by Mexican citizens, on the ground of public policy, which condemns the use of landed estates against the public good, in disposing of them to persons inimical to the good of the Republic, thereby making the plain spirit of the Constitution of no effect, and withdrawing the protection of the general Government from the frontier states.

The intent of the Constitution and the laws passed both before and since its adoption are the same, viz: The prohibition of foreigners, (American citizens) from settling on the frontier, and thereby taking possession of a portion of Mexican territory.

The Mexican government has proclaimed, without equivocation, that these laws are intended to protect her frontier; and indeed it might be said, they constitute the only barrier left to a nation, that has had reason to fear for her existence among the governments of the earth, and now lies at the mercy of a powerful nation, a considerable portion of which is even desirous of acquiring further territory south of her borders, with a view to her ultimate absorption.

A telegram has lately flashed across the wires that a powerful element in the United States are urging upon American capitalists the necessity of securing the Panama Canal as United States territory, and thus secure the key to the commerce of the world. This is being urged secretly upon Congress, it is said, and force is hinted at as the ultimate means to secure the object. Whether this be true or not, annexation of Mexico is the ultimate outcome of the Monroe doctrine. This doctrine—save when applied to European nations, in which Mexico joins with us in her laws relating to the States and foreign nations—is a piece of arrogance that is unworthy of any nation, and an attempt to use the political sentiments of an honored and illustrious ex-President to carry out a selfish purpose is unwarranted, and will arouse an opposition in the United States and Mexico that will not only retard but actually imperil their mutual commercial relations, as well as the large property interests of Americans in Mexico, and result in a positive loss of the trade with Mexico.

That American capitalists should desire to control or own the Panama Canal, or the Nicaragua Canal, and hold this important element in the world's commerce is natural and proper enough; but to go any farther than this is actually imperiling the object to be attained, viz: to hold that commercial vantage ground, and secure the trade of Mexico also. It simply resolves itself into two dilemmas if extreme measures are resorted to. On the one hand, the acquisition of the Isthmus and the loss of the trade of Mexico; or on the other, the securing of that trade by friendly relations, and satisfaction with our present acquisitions of territory, with a friendly control of the Isthmus by a liberal expenditure of private capital. The latter we take to be the most sensible course, and in our opinion more likely to secure the desired result. These restrictive laws before mentioned will never be repealed

until the United States gives a solemn pledge by treaty stipulation repudiating any desire for annexation of Mexican territory without the consent of the Mexican people.

Manner of Acquiring Real Estate in Mexico.

Land is acquired in Mexico by denouncement, purchase, donation, accession, prescription, adjudication and inheritance, in accordance with the laws heretofore mentioned. The law relating to Baldios Terrenos limits the acquiring of said lands to 2,500 hectares (about two and a half acres to each hectare) to each denouncer, but this may be increased at the pleasure of the Government. The price of public lands has varied in different localities. The law of 1863 and 1864, *Leyes de Reforma*, page 177, vol. 2, placed the price of public land in the territory and States named as follows: Lower California, 12 cents per hectare; Sonora, Chihuahua, Sinaloa and Durango, 25 cents; Coahuila, New Leon and Tamaulipas, 18 cents; and the highest, viz, \$3.50 in the States of Guanajuato, Pueblo, Tlaxcala, Toluca, and Mexico. The prices under this law have been changed to some extent, however, we are informed by Judge Galan. This is probably owing to the progress made in railroads, and increasing prosperity, and the numerous colonies since organized. All the inhabitants of the republic are privileged to acquire public and private lands by any title whatsoever by the laws, except citizens, native and naturalized, of the nations bordering on the republic, *who cannot by any title acquire public lands in any of the border States.*

Foreigners may be admitted to the privilege of citizenship by naturalization, or by the purchase of real estate, or by having Mexican children, provided they do not manifest a desire to keep their nationality, and are of the age of 21 years if unmarried, or 18 if married, and possess an honest means of livelihood. Any Mexican citizen inhabiting the republic may denounce vacant lands in any of the States bordering on the frontier.

Query 1st. Can an American, after becoming a naturalized Mexican citizen, claim the same privilege?

There are Mexican lawyers of the opinion that Art. 2nd of the *Ley de Baldios*, July 20th, 1863, prohibited Americans from ever acquiring, by any pretense whatever, vacant lands, by any title whatsoever, in the border states, even though they become naturalized Mexican citizens, in good faith. It has been the policy of Mexico, ever since the loss of Texas, to prevent the acquisition of lands in the border states or territory by Americans, native or naturalized.

Query 2nd. If this opinion be incorrect, and former Americans may acquire vacant lands in the border states; in the event of their returning to the United States and remaining there for two years, with the intention of never returning to Mexico as Mexican citizens, will their title to said lands be forfeited?

The treaty of July 10th, 1868, provides that such return and absence shall be deemed a renunciation of said citizenship; which, however, may be rebutted by evidence to the contrary; yet, when the fact is established of renunciation of naturalized citizenship, what effect will this have on titles to former vacant lands from the government, since they are no longer Mexican citizens, but are now classed among aliens contemplated in the restrictive laws?

This is a problem not so easily solved. A Mexican becomes an American citizen, or declares his intention to do so, and pre-empt a quarter section of vacant land of the United States, and obtains a patent therefor. He then holds the land under the highest title known to the law. He returns to Mexico, and remains there two years, with the intention of never coming back. Does his title to the land here become forfeited? If so, to whom and how? This question, once solved, determines the foregoing query, as the treaty is the law in both countries.

Query 3rd. Whether the power vested in Congress "to prescribe the rules under which the public lands may be occupied," by Fraction 24, Art. 72, of the Mexican Constitution, is affected by the aforesaid treaty? If not, whether said constitution does not authorize Congress to pass a law additional to the law of July 20th, 1863, revoking titles held by Americans to lands received from the Government of Mexico, who have lost their naturalized Mexican citizenship?

Query 4th. Whether the said constitution vests in Congress the power to revoke all titles held by American citizens from Mexican citizens to real estate in any of the border states, or all of them, as a measure of public policy contemplated by the constitution, and in harmony with the spirit of the laws of Mexico, which prohibit American citizens from ever acquiring real estate from the government in any of the border states; said laws being intended to protect the frontier?

The following manner of acquiring real estate applies to American citizens:

1st. In order to acquire a title by government grant to public lands in the border states of Sonora, Chihuahua, Coahuila, New Leon, and Tamaulipas, and the territory of California, (such a title being doubtful, to say the least) it becomes necessary for American citizens to renounce their nationality by naturalization, and become residents and domiciled in the republic; providing naturalization grants the privilege of acquiring a title to public lands after naturalization.

2nd. In order to acquire a valid title from a Mexican citizen to real estate in any of the aforementioned border states, the American citizen must become a resident and domiciled in the Republic of Mexico.

3rd. In order to acquire a title by denouncement—providing it can be acquired—to vacant lands from the government, an American citizen must become a naturalized Mexican citizen, and a resident and domiciled in the republic. This will apply also to lands held by possession, or prescription, without a title, from the government.

The procedure in denouncement of public lands is as follows:

Manner of Denouncing Public Lands.

The following legal opinion touching the denouncement of vacant lands, by Hon. Judge Carlos F. Galan, formerly one of the magistrates of the Supreme tribunal of Sinaloa and Lower California, but now practicing law in this city, is given to the public with the permission of Judge Galan.

"A petition is presented to the District Judge, (Federal) describing the land by metes and bounds. The Judge orders the denouncement to be published in a newspaper for a period of three weeks. If no opposition is made, the Judge orders a survey of the land denounced, to be paid for by the denouncer, but in accordance with certain rules given by the government. That done and presented to the Judge, the expediente is given for examination to the District Attorney, who objects or not, as the case may be. In case of objection, the Judge orders a new survey, or whatever may be needed, in accordance with the District Attorney's opinion. When all is found correct, the Judge adjudicates the land to the denouncer; a certified copy of all the proceedings is taken at the expense of the denouncer, and sent to the Governor of the state where the land is situated. He reports favorably or otherwise, and sends the papers, always at the expense of the denouncer, to the Minister of Fomento, in Mexico, and there the papers remain till their turn comes, and then the Minister may or may not issue a patent. That issued, it is sent to the District Judge, who gives the judicial possession of the land, (not gratis, however) and the patent is delivered after paying for the land."

TONITE

PATENT

SMOKELESS BLASTING POWDER.

This Powder has been in use in England for five years, and its consumption has steadily increased; the sales this year being quite 25 per cent. more than in 1879. It has given the greatest satisfaction, and wherever it has received a trial, it is preferred to any of the other high explosives on the market, on account of its remarkable merits, which will be even more highly appreciated on this coast than in England, owing to the greater extremes of heat and cold in our Mining Districts.

It does not FREEZE.

It does not DETERIORATE when kept in **HOT PLACES.**

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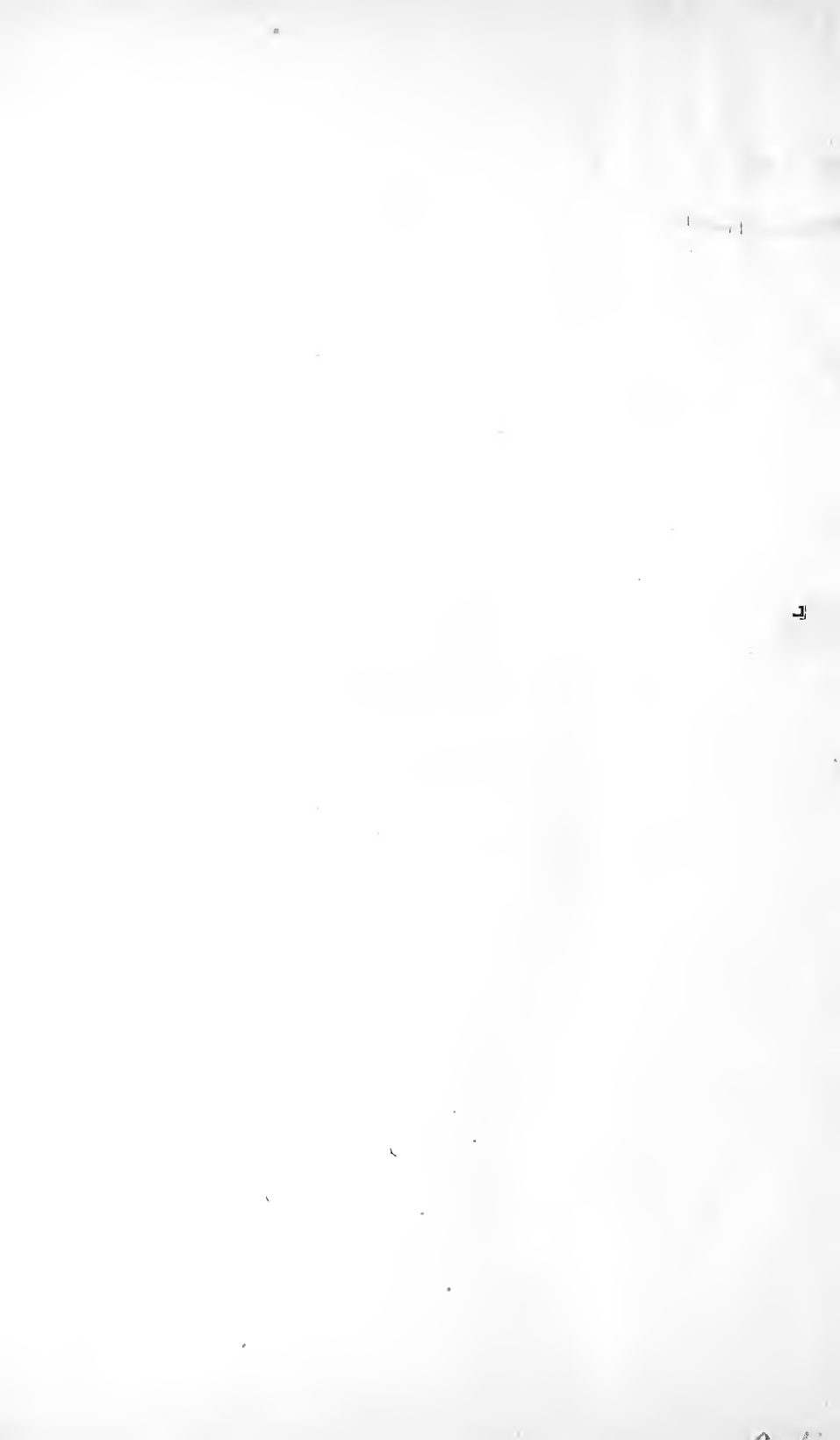
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